

Eliminating Barriers to Commercial Production of Sunray Venus Clams in Florida: Enhanced Hatchery Production Through Broodstock Development

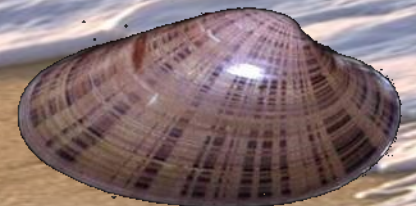
John Scarpa

HARBOR BRANCH

FLORIDA ATLANTIC UNIVERSITY*

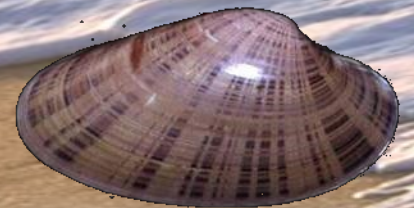
Leslie N. Sturmer

UF UNIVERSITY of
FLORIDA
IFAS



Sunray Venus Clam: A New Species to Diversify the Florida Hard Clam Aquaculture Industry

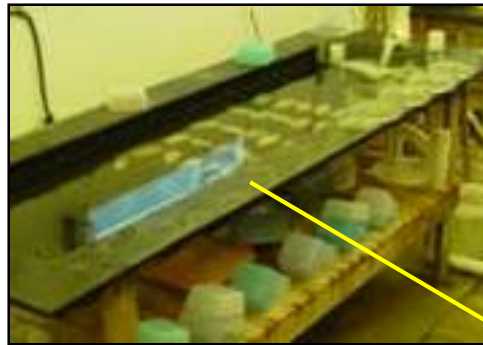
- Funded by Florida Sea Grant, L/LR-A-44, **2006-08**
 - John Scarpa, Harbor Branch Oceanographic Institute at FAU
 - Leslie Sturmer, UF IFAS Cooperative Extension Service
 - LeRoy Creswell, UF Florida Sea Grant
 - Jose Nunez, UF The Whitney Lab
 - Chuck Adams, UF IFAS Food and Resource Economics



Identified Methods for Broodstock Handling and Spawning

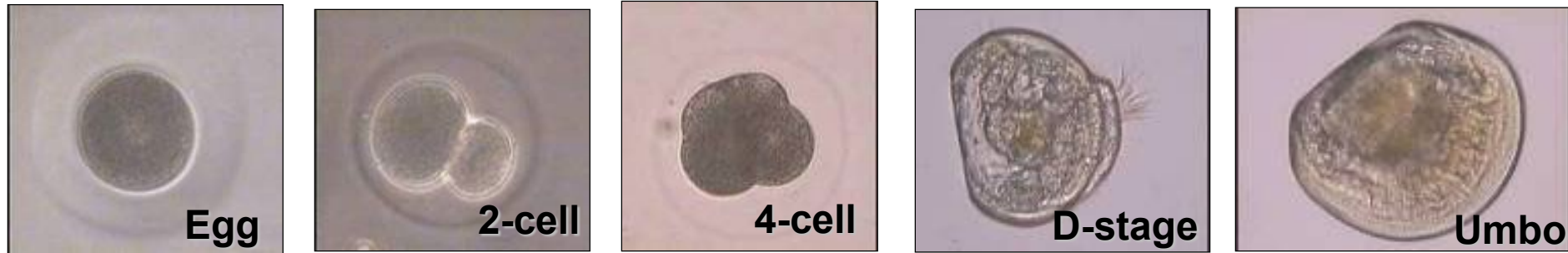


*Conditioned at 28-30 ppt, 65-75°F
and fed adequate microalgae*

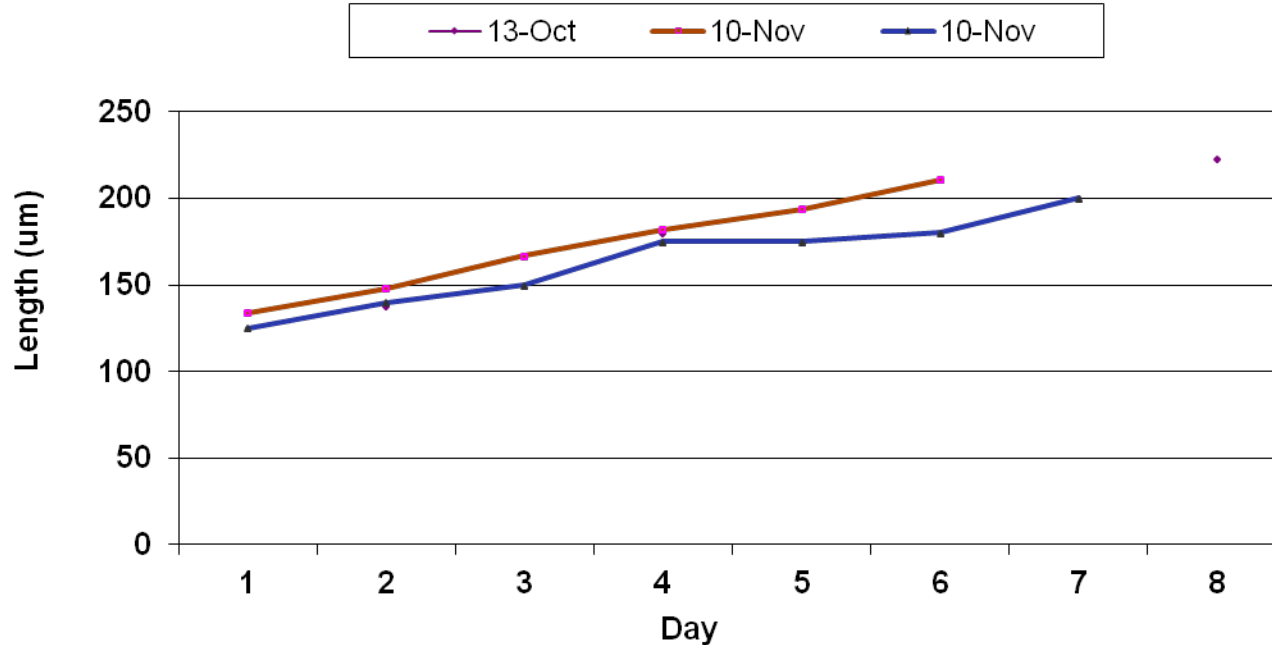


*Induced spawning by using
thermal cycling, temperature
increased 10-20°F above
ambient (70°F), and addition
of dissected sperm*

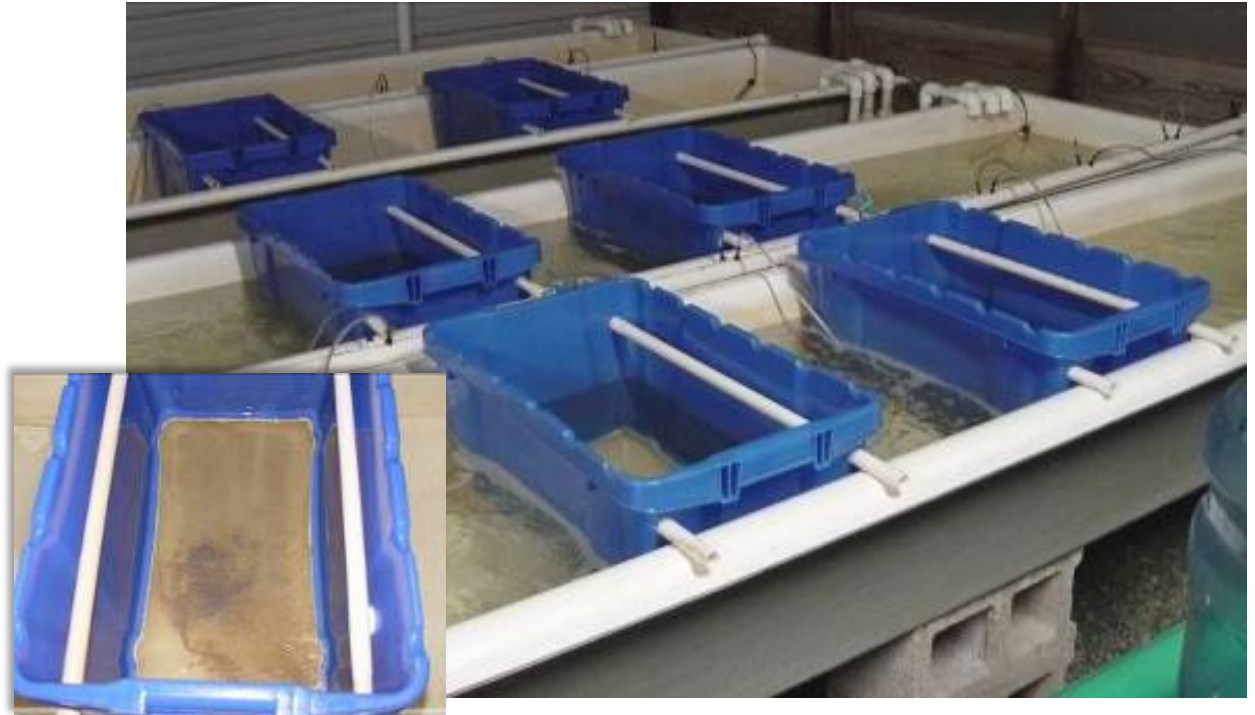
Established Hatchery Protocols for Rearing Embryos



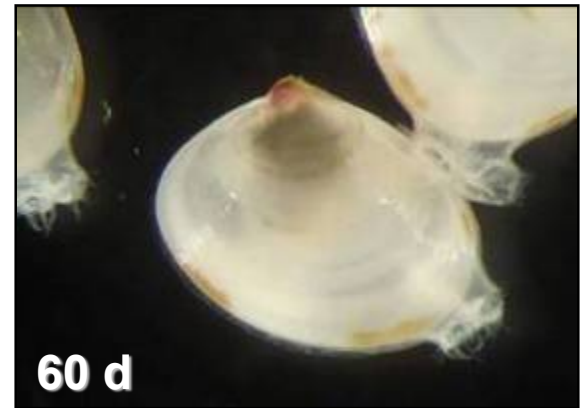
Embryological development documented, similar to most bivalves, except eggs have noticeable gelatinous membrane



Established Hatchery Protocols for Larval Metamorphosis and Early Post-Set



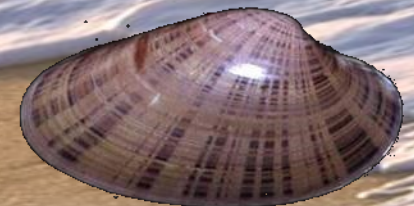
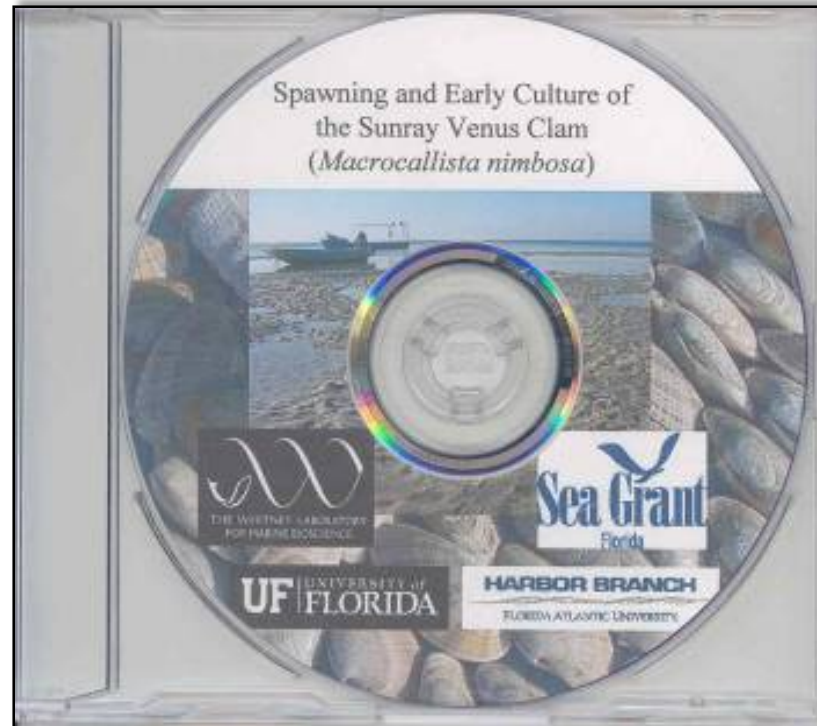
Pediveligers stocked at 2-3K/ft² of bottom area, fed microalgae, and rinsed with saltwater



Reared Post-Set to Nursery/Growout Seed Using Standard Hard Clam Methods

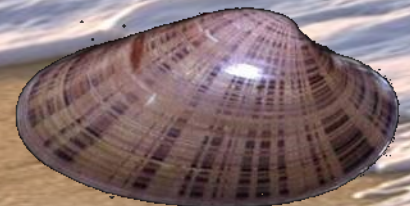


- **DVD summarizing seed production techniques and documentation of sunray venus development during hatchery phase is available**

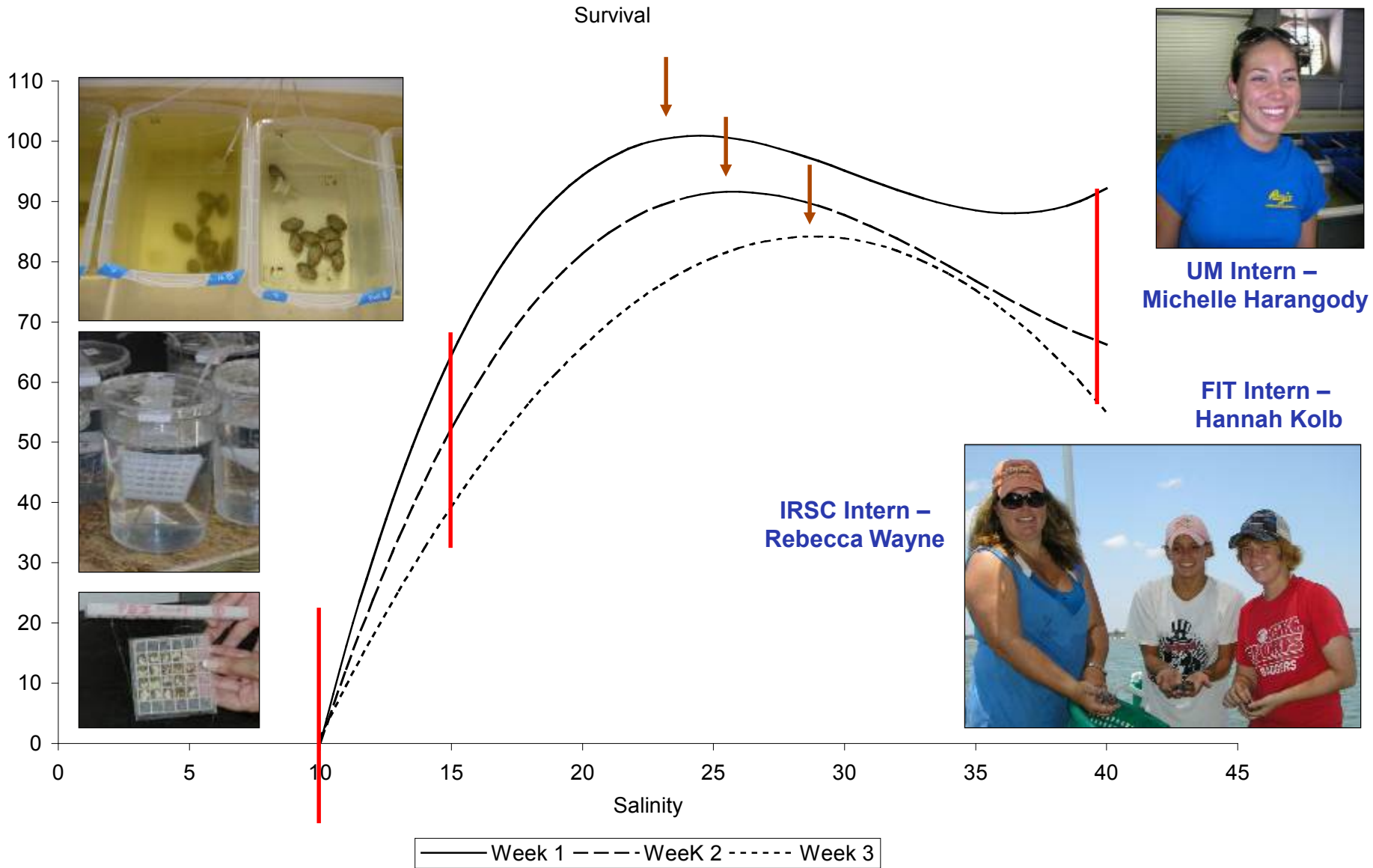


Species Diversification in FL Aquaculture: Nursery and Growout of the Sunray Venus Clam

- Funded by Florida Sea Grant, L/LR-A-45, **2008-10**
 - John Scarpa, Harbor Branch Oceanographic Institute at FAU
 - Leslie Sturmer, UF IFAS Cooperative Extension Service
 - LeRoy Creswell, UF Florida Sea Grant
 - Chuck Adams, UF IFAS Food and Resource Economics

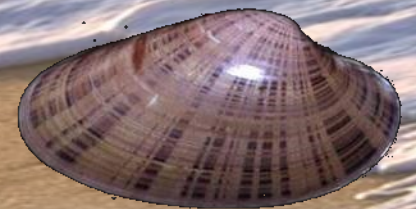


Determined Salinity Preference of Nursery and Growout-Sized Sunray Venus Clam Seed



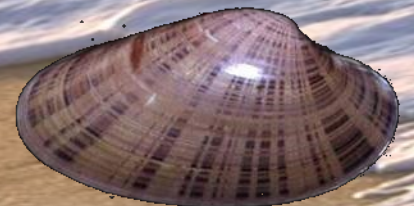
Eliminating Barriers to Commercial Production of Sunray Venus Clams in Florida

- Funded by Florida Sea Grant, L/LR-A-46, **2010-12**
 - John Scarpa, Harbor Branch Oceanographic Institute at FAU
 - Leslie Sturmer, UF IFAS Cooperative Extension Service
 - Chuck Adams, UF IFAS Food and Resource Economics
 - Steve Otwell, UF IFAS Food Science and Human Nutrition
 - Rex Ellis, UF IFAS Soil and Water Science
 - Todd Osborne, UF IFAS Soil and Water Science
 - Mark Clark, UF IFAS Soil and Water Science

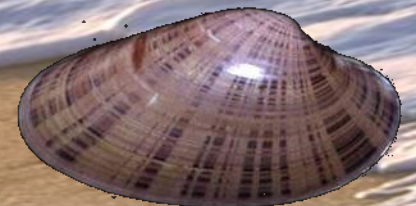


Rational and Objectives

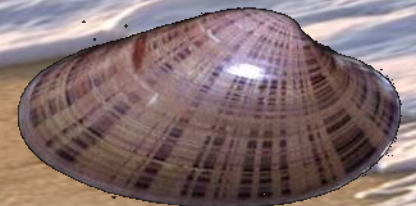
- Broodstock production and education will aid commercial hatchery operators in their initial production of sunray venus clam seed for the industry.
 - Create initial founder broodstock lines for Florida hatcheries.
 - Demonstrate to hatchery operators the proper development of broodstock for seed production.



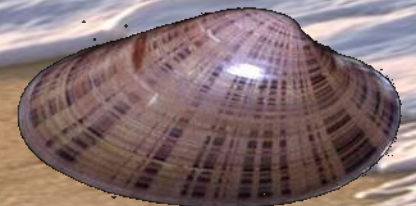
Develop broodstock lines that provide greater genetic variation.



Why is this important to seed producers and clam farmers?



- Seed producers: By having large genetic variation you are able to select for more desirable traits (e.g., growth, heat tolerance, color).
- Farmers: Large genetic variation increases environmental adaptability in individuals and within populations (incr. survival).



Creating Initial Founder Broodstock Lines for Florida Hatcheries

Effective Parental Number



Demonstrated to Hatchery Operators The Proper Development of Broodstock for Seed Production



Industry Members – Doug Telgin, Anthony Hinkle, and Barry Hurt



FAU Graduate Student – Elyse Steiner

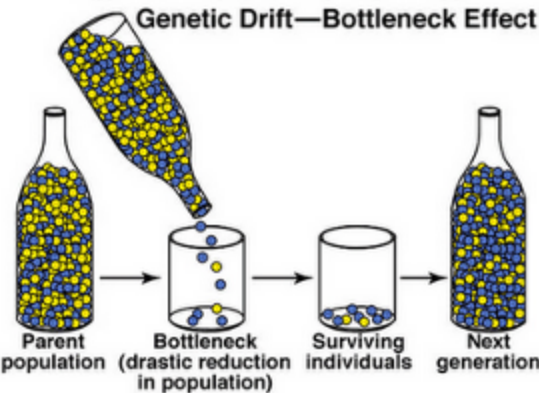


Industry Members - Terry Lange, Tom McCrudden, and Bruno Cristofori

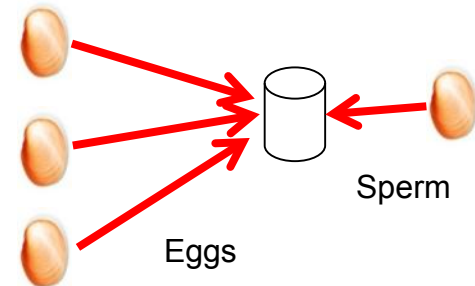
What is a genetic bottleneck?

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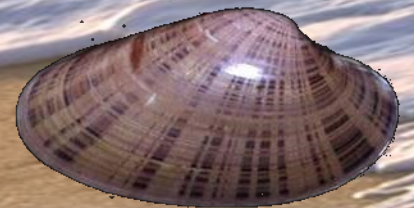
Genetic Drift—Bottleneck Effect



A Better Way?

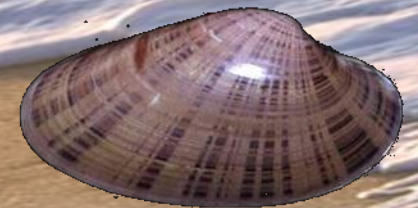
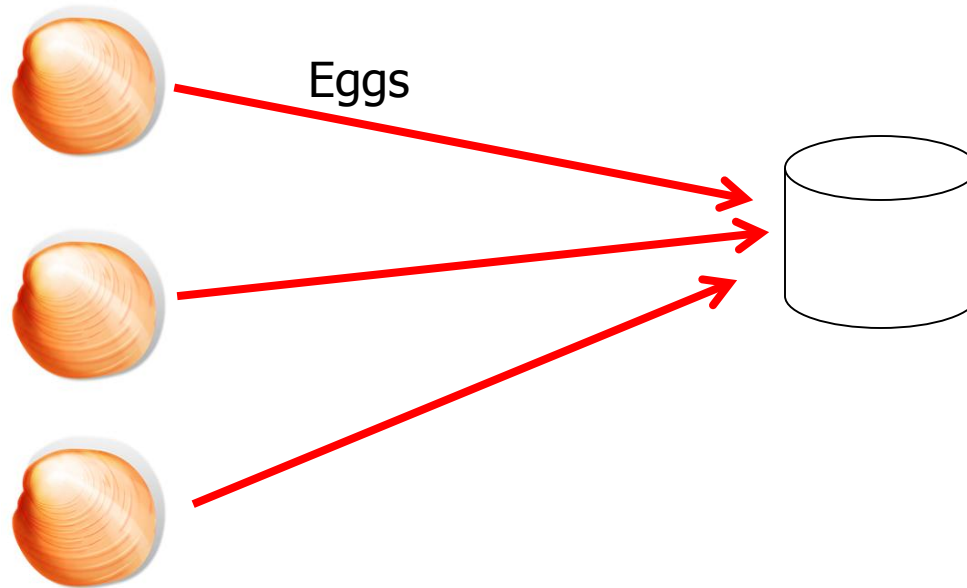


Recommendations



1. Let females spawn and place eggs together, then split into different containers for each male.

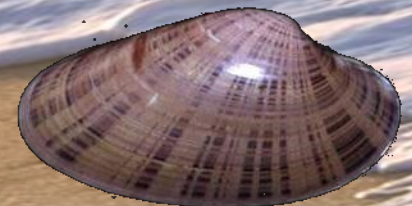
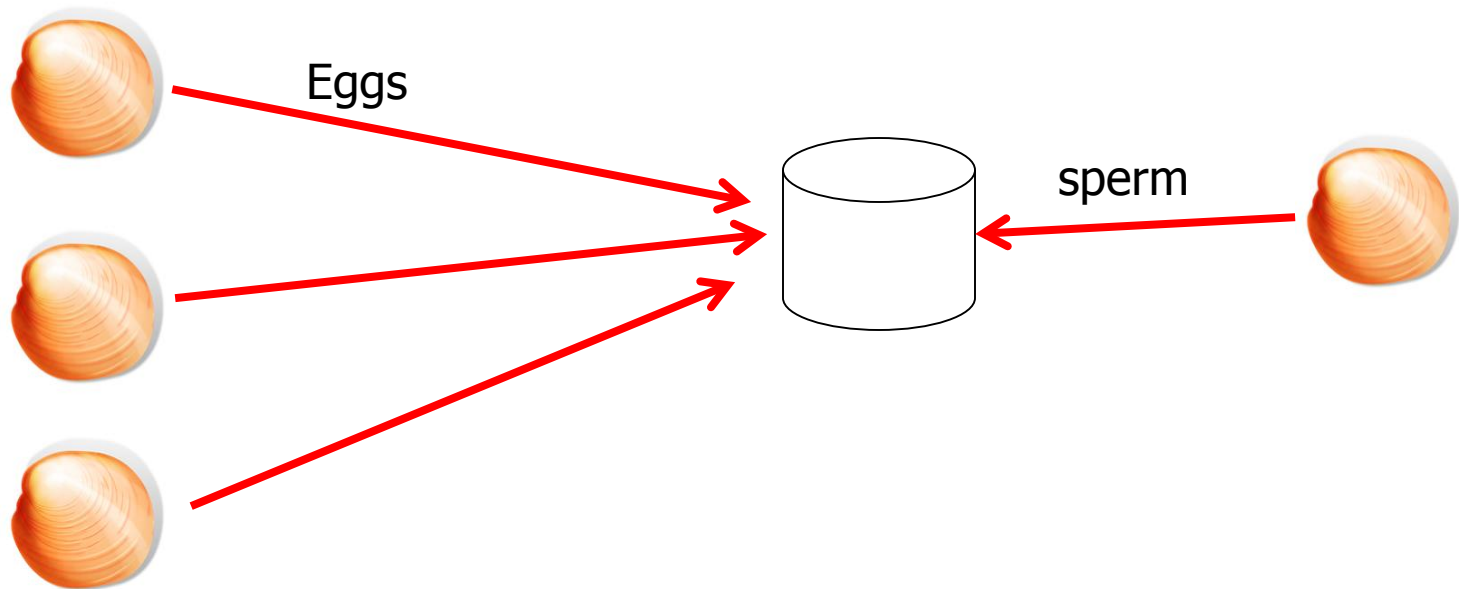
Females



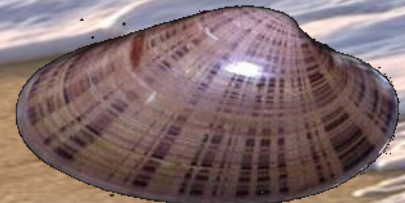
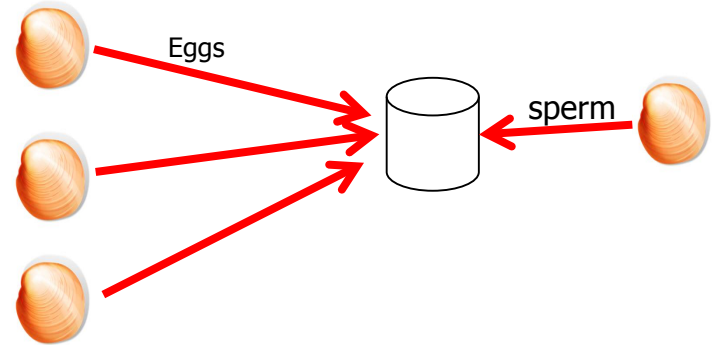
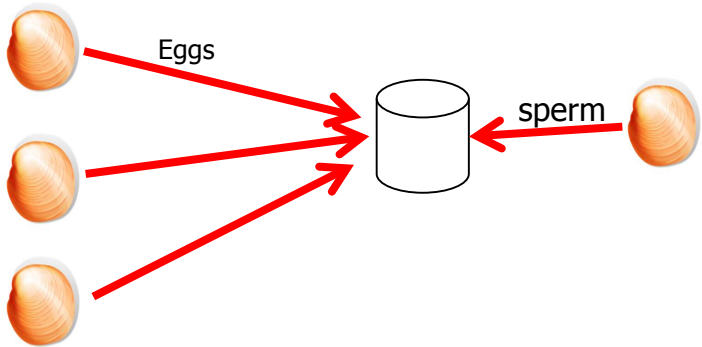
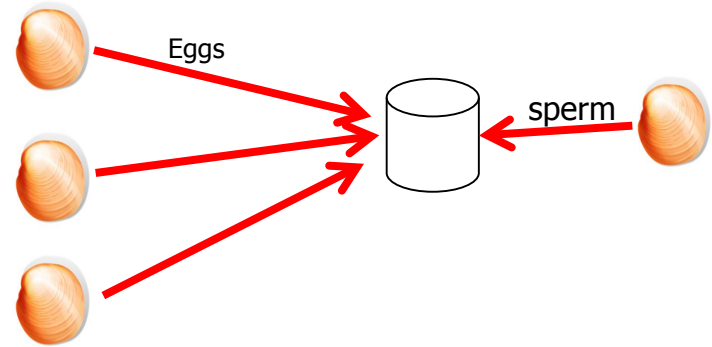
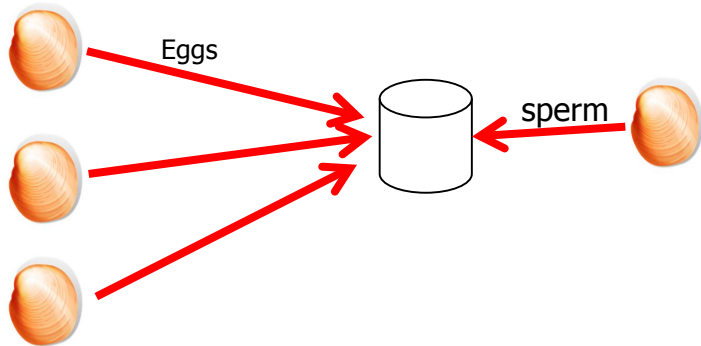
2. Inseminate each container with sperm from one male.

Females

male



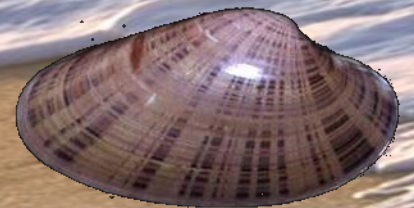
3. Repeat for **all** males!



By using:

- 1) factorial mating (along with the concept of effective parental number),
- 2) controlled spawning, and
- 3) good record keeping

you will have a better broodstock line that will ensure your clams have greater genetic variation for future selection and hardiness.



Thanks to Van Lewis,
FL Sea Grant and all of the
growers and researchers.

Questions?

