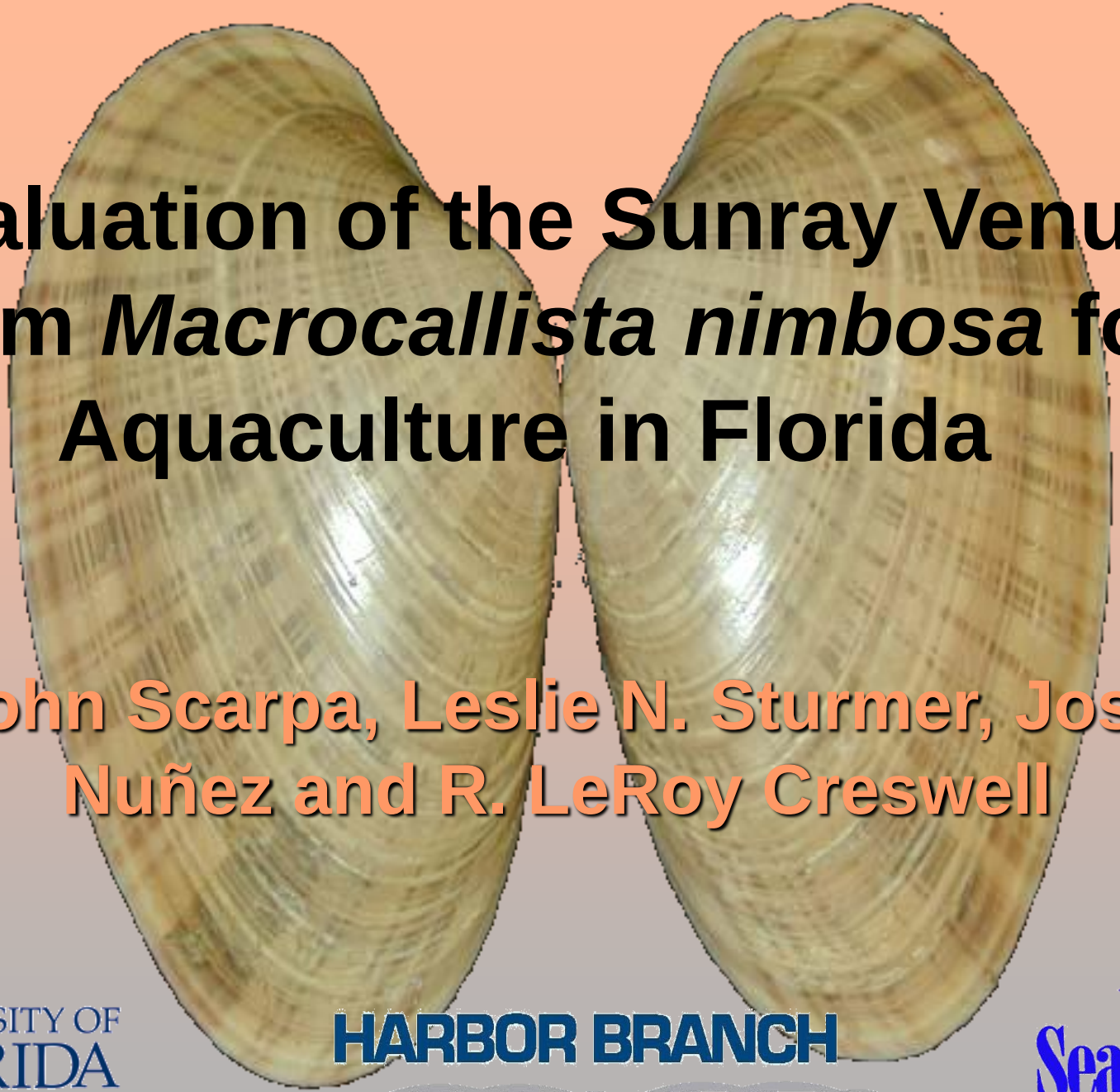

Evaluation of the Sunray Venus Clam *Macrocallista nimbosa* for Aquaculture in Florida

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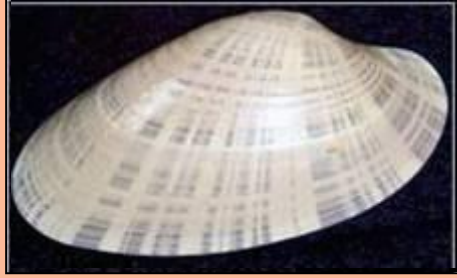
Sea Grant
Florida

Background

- Florida bivalve aquaculture production: $0.4M in 1987, $18M in 2001, $10M in 2005
- Based “solely” on hard clam
- Diversifying product line may avoid economic, marketing, and disease problems
- Different species have been examined (e.g. angel wing, bay scallops, ark clams)
- New species: Sunray Venus

Background



- Attractive large (up to 6”SL) clam distributed from SC to FL
- Targeted species for commercial harvest in 1960s along west coast
- Harvest halted due to spotty distribution, limited fishing grounds
- Natural growth rate experiments suggested fats grower
  - (3”, 40 g in 12 months)

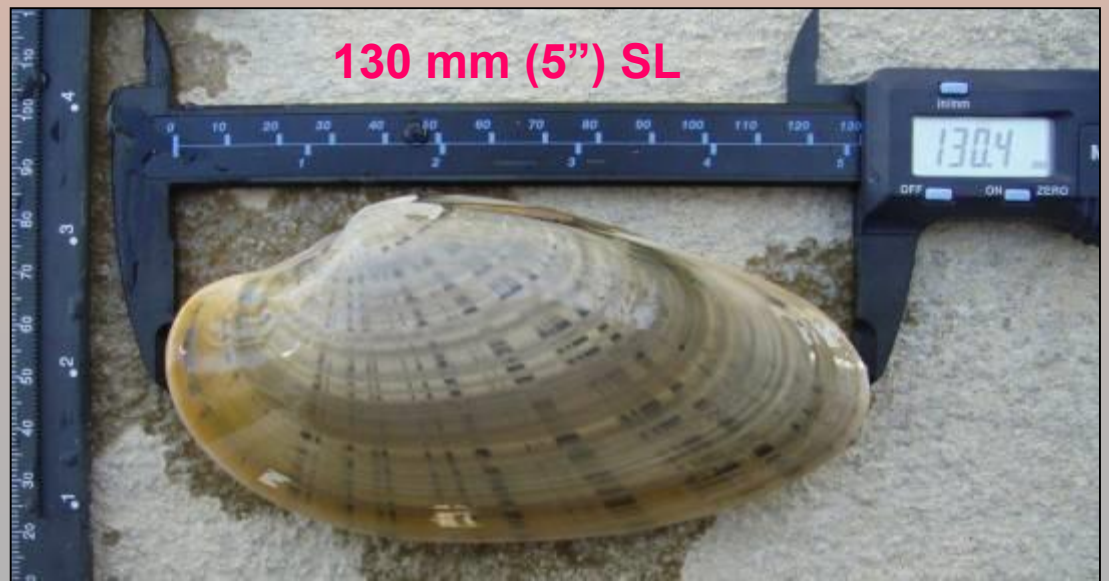
Shell pile at Apalachicola processing plant
Photo courtesy of Florida State Archives

Objective

- Utilize current hard clam methods as a starting point to:

  1) Identify spawning methods
  2) Establish hatchery protocols
  3) Examine nursery culture
  4) Grow a test group
  5) Test market acceptance

Broodstock



Broodstock

Wet Shipping

Dry Shipping

Broodstock

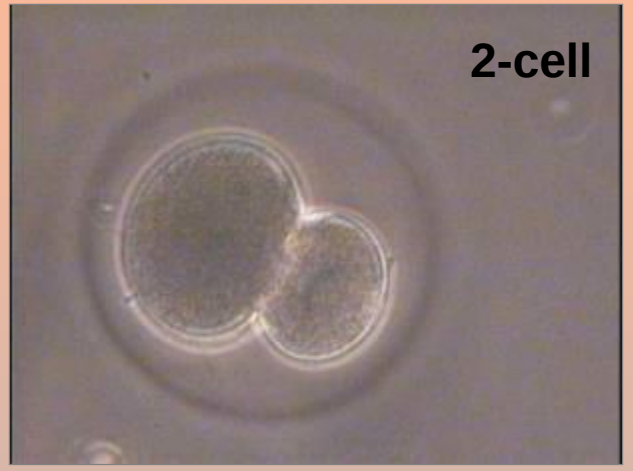
1:1 sex ratio

< 10% mortality after 1 week

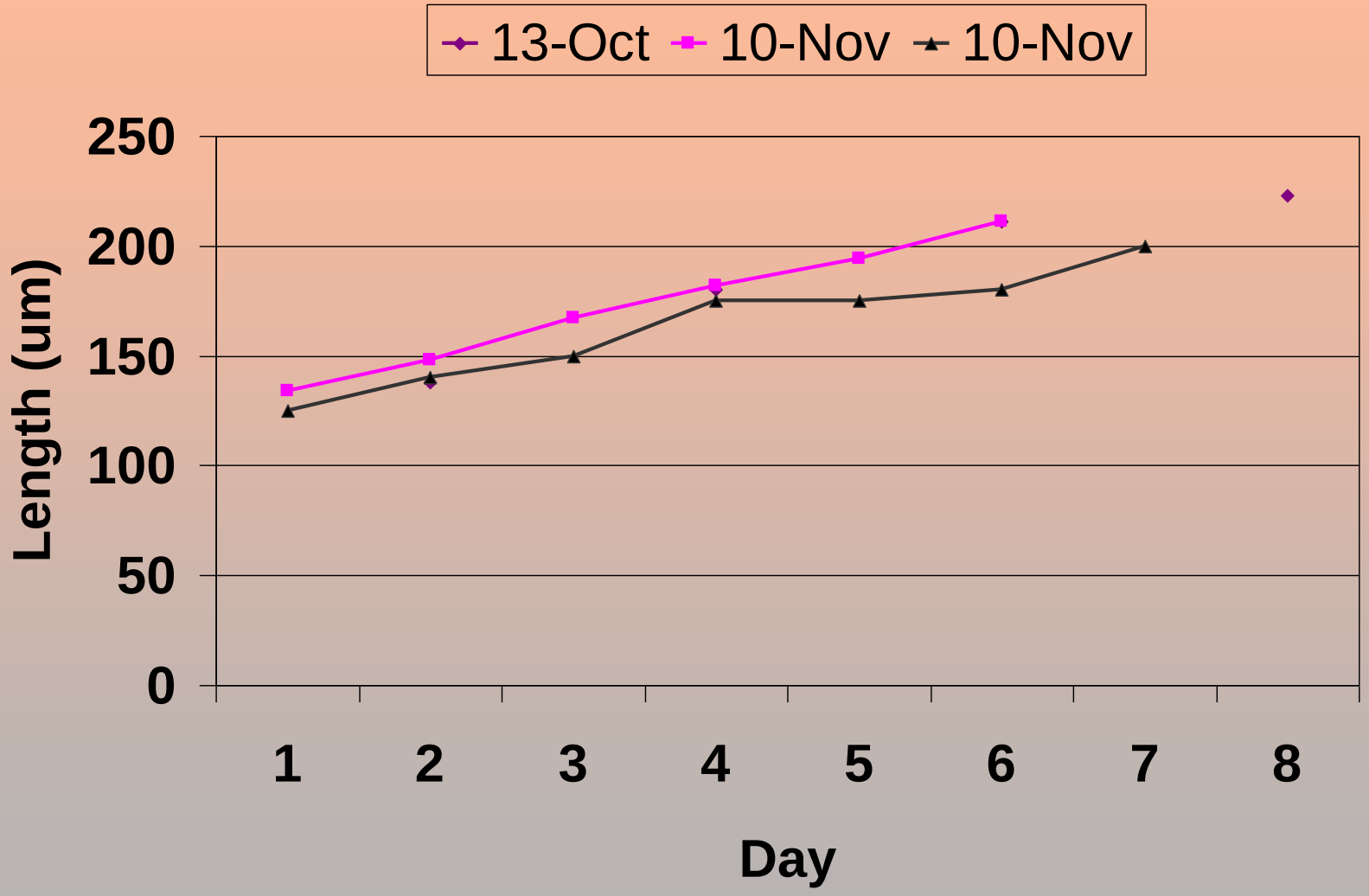
Spawning

Thermal Shock -
(increase 10^{o}C)
Dissected sperm addition
Serotonin injection -
(0.4 mL 2mM)

Larvae Culture



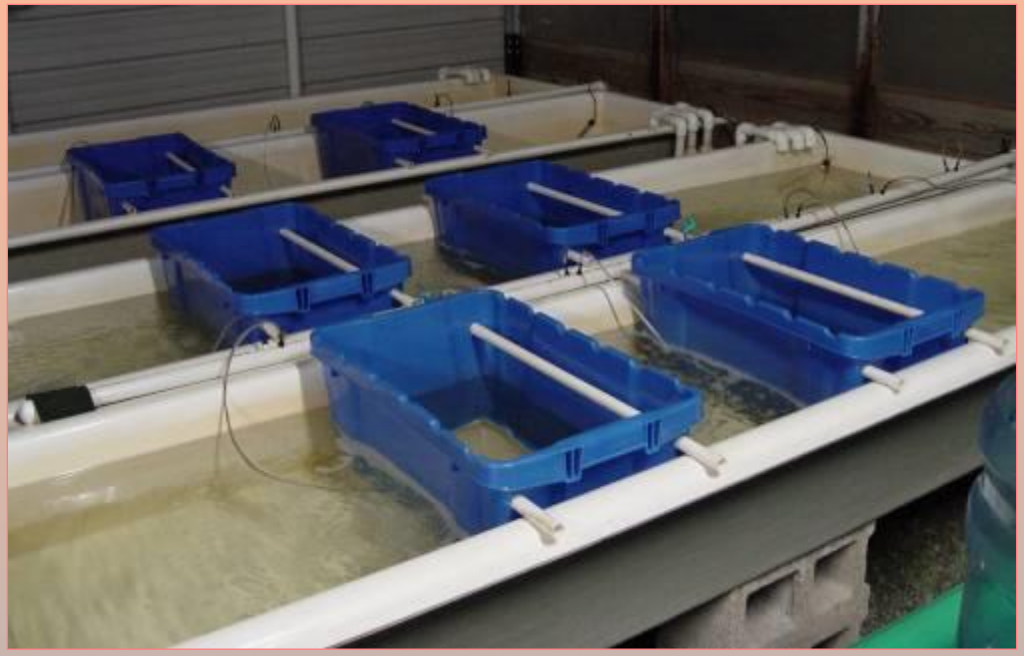
Larval Growth



Survival: 13 Oct: - 13% ??, 10 Nov HBOI – 88%, 10 Nov UF – 85%

Larval Culture

Post-Set Culture



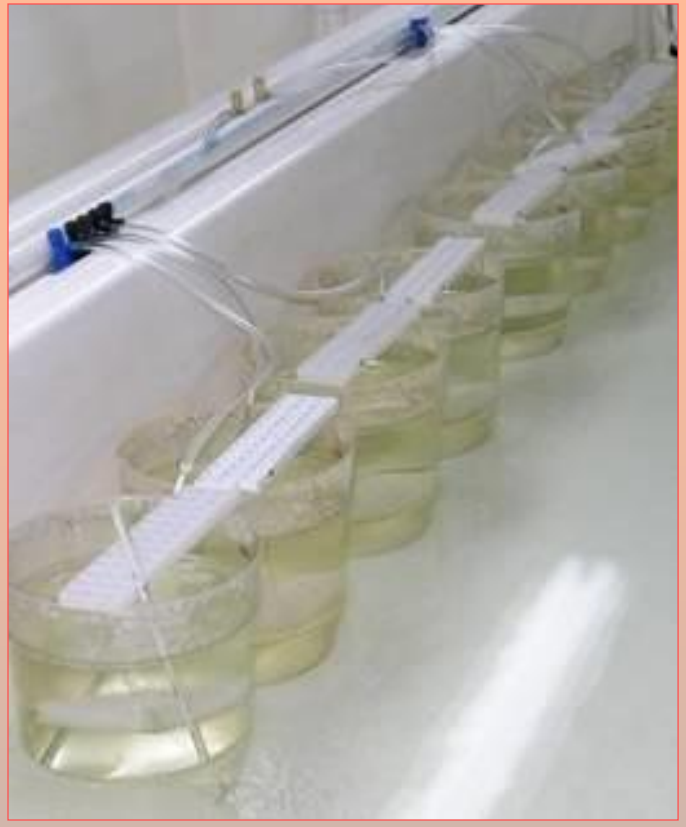
No Substrate
Aragonite (0.5-1.0 mm)
Sand (<0.5mm)

Post-Set Culture

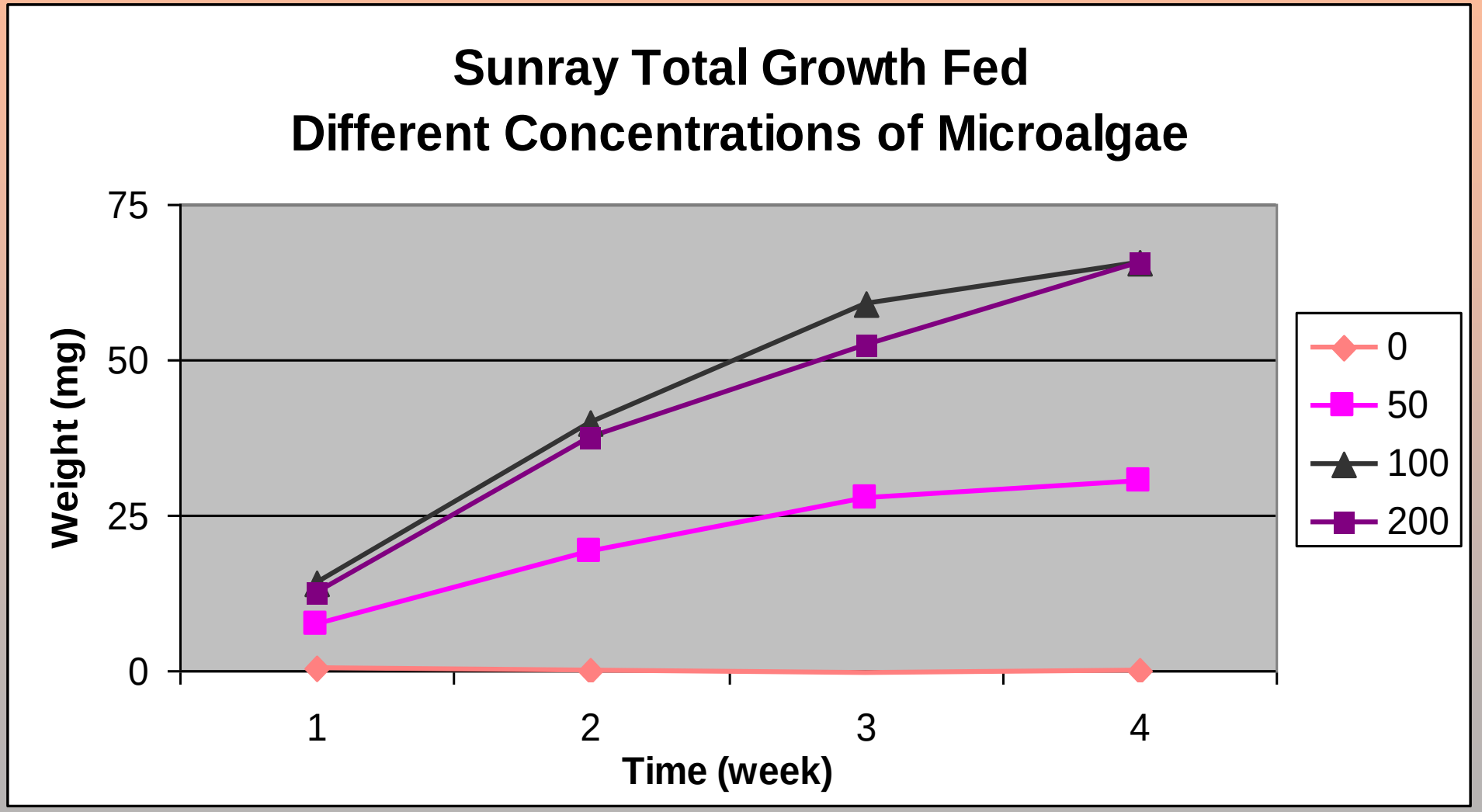
- First Exp: (n=1)
  - Sand: **100%**
  - Aragonite: 71%
  - No Substrate: 49%
  - Total: 32,000 juveniles
    - 63% return
- Second Exp: (n=3)
  - Sand: 58%
  - No Substrate: 35%
  - Total: 454,000 juveniles
    - 46% return

Feed Experiment

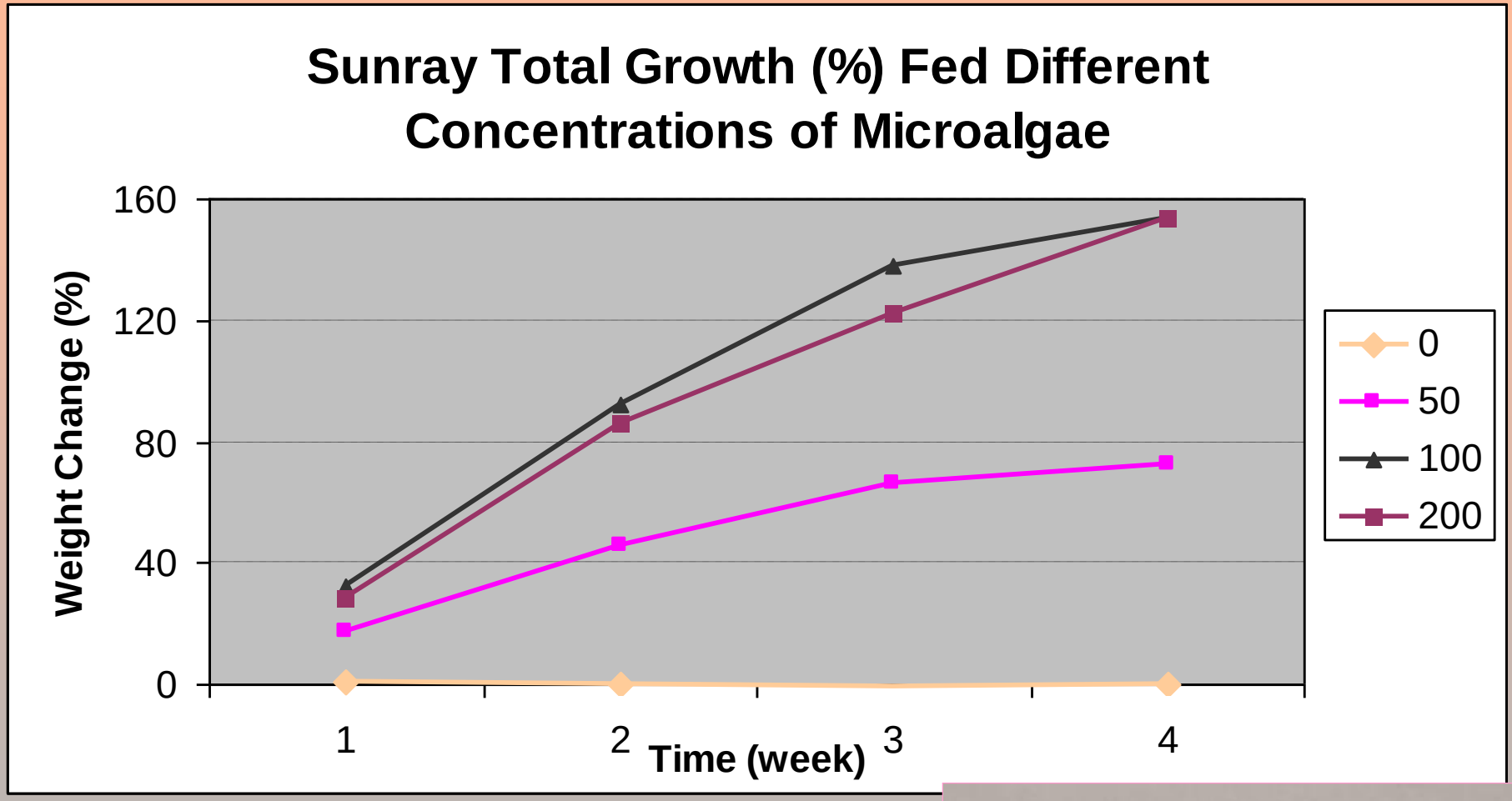
- Triplicate 4-L beakers
- 24 clams/beaker
  (42±3 mg/clam)
- Fed T-Iso, twice/day
  (0, 50, 100, 200K cells/mL)
- Salinity ~30 ppt
  Temp 73-84ºF



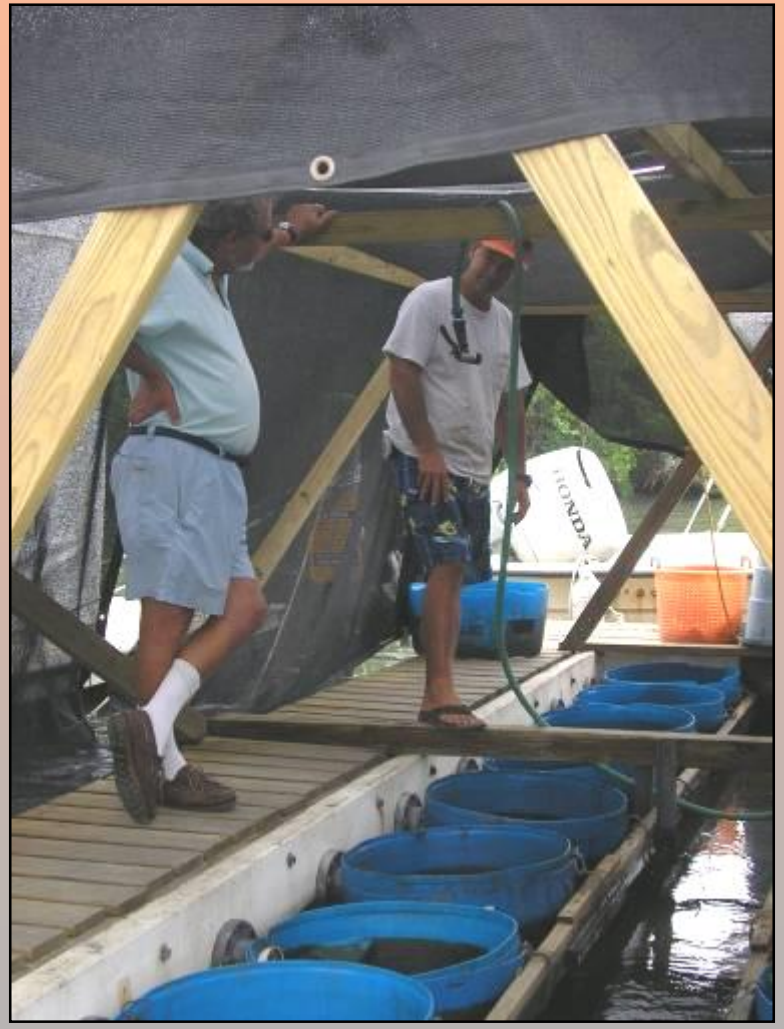
Feed Experiment



Feed Experiment

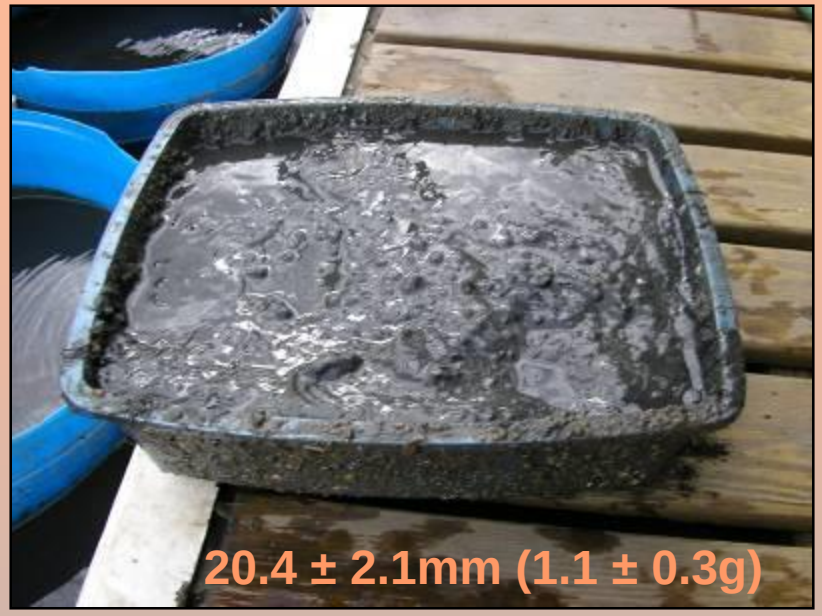


Land-based Nursery



37/mL at 17,200/m^2 (1600/ft^2)

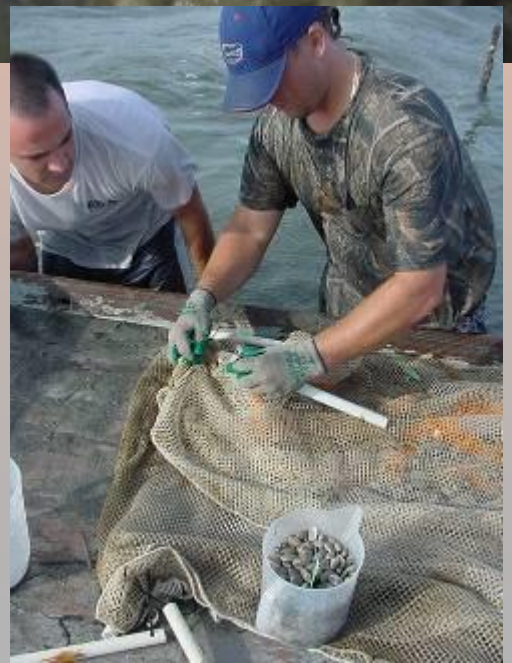
Land-based Nursery (4 months)



Land-based Nursery

118,000 seed available for field nursery trials

Field Nursery – Bottom Bags



Nursery bags (3’ by 4’) made of
4 mm polyester mesh material

Stocked at densities of 332 – 554/ft²
Nursery periods of 78 – 128 days
Sites in Alligator Harbor and Cedar Key

Field Nursery - Cages

Nursery cages (3’ x 1.5’ x 6” deep) constructed of wire and lined with 4 mm polyester mesh material

Stocked at densities of 100 – 375/ft²

Nursery periods of 42 – 119 days

Field Nursery Results

Site*	Sieve (mm)	System	Density** (#/ft²)	Survival (%)	Growth (mm/month)
AH	>9.0	Cage	200	94	6.5
AH	>9.0	Cage	100	69	5.9
AH	>6.7	Cage	222	70	5.3
AH	>6.7	Bag	332	78	3.4
AH	>5.0	Bag	554	32	5.0
CK	>6.0	Cage	375	82	4.1
CK	>4.0	Bag	441	90	3.9

* AH – Alligator Harbor, CK – Cedar Key

** Density of 4' x 4' nursery bag stocked at 10,000 hard clams = 625/ft²

Field Nursery Results

Approximately 75,000 juveniles (22-28 mm SL) nursed for growout trials during June – December 2007

Growout

Growout bags (4’ x 4’) made of 9 mm polyester mesh material

Growout bags (4’ x 4’) made of 9 mm polyester mesh material with internal 1”- and 1 ½”-PVC pipe frames, covered with plastic netting

Several growout systems being evaluated

Growout

Growout cages (3’ x 3’ x 6” deep’) constructed of wire and lined with 9 mm polyester mesh material

Bottom plant (4’ x 8’) covered with 9 mm polyester mesh material and chicken wire

Several growout systems being evaluated

Growout

Evaluating stocking densities* ranging from 38 to 70/ft^2

***** Hard clams planted at 1200 per 4' x 4' bag = 75/ft^2

Growout

Measuring at intervals the following parameters:

- Growth – SL, SW, SH, weight, meat weight
- Survival
- Condition Index
- Histology

Summary

- **Sunray Venus clams were successfully:**
- Collected and transported broodstock
- Spawned for first time under controlled conditions in hatchery
- Cultured through setting, land-based and field nursery
- Methods similar to hard clam
- Growout to “marketable-size” proceeding

What's Next?

- Harvest test plants
- Determine shelf life
- Evaluate "grit" pocket and "degritting" methods
- Test market acceptance
  - Chefs
  - Restaurants
  - Sushi market sector
- Determine salinity and temperature preferences for seed sizes
- Characterize economics

Sunray Venus Clams!

Acknowledgements

- **Supported by Florida Sea Grant (R/LR-A-44)**
- **Many, many people who assisted in collecting and caring for the clams:**

  Eric Cassiano, Chuck Mulligan, Reggie Markham (UF)
  Ewan Leighton (Leighton Clam Co.)
  Kevin Reinecke (Blue Acres)
  John Stevely, Don Sweat (UF Sea Grant)
  Van Lewis, Johnny Sheridan, Andy Arnold
  Chris Taiani, (Big 'T' Clams)
  Fred Prahl, Kyrstal Baird (HBOI)
  and those we have missed