

Eliminating Barriers to Commercial Production of Sunray Venus Clams in Florida:

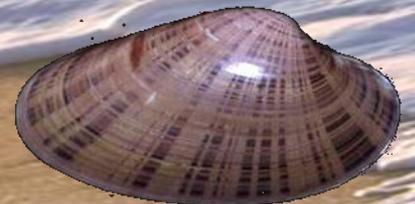
Characterization of Aqueous Soil Properties for Growout

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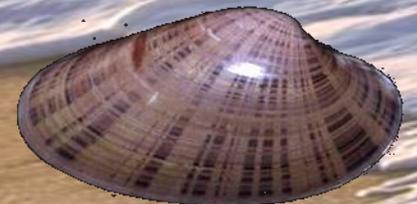


Rational

Sunray venus (*Macrocallista nimbosa*) lives in soil.

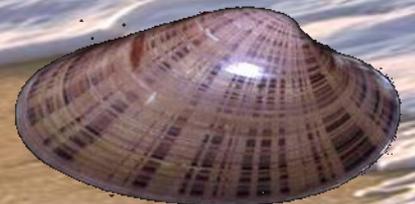
Soils knowledge should aid:

- determining compatibility of existing shellfish culture leases
- siting future leases



Project Objectives

- Investigate relationship between soil properties and sunray venus (SRV) growth
- Develop soils-based guidelines for selection of future SRV culture lease sites



1st Bucket Study: 2010-11

Objective

Investigate particle size and soil OM effect on SRV growth

Methods

Select three soils spanning a range of particle size and OM content:

Sand (natural habitat)	99% sand	0.5% OM
Muddy Sand (UF lease)	97% sand	1.3% OM
Mud (salt marsh)	80% sand	9.2% OM



1st Bucket Study: 2010-11

Methods cont.

Soil:

- Fill 3-gallon buckets with soil: 3 types x 6 reps
- All 18 buckets planted at one lease to minimize env. factors (e.g. salinity and temp.)
- Measure sulfide at harvest

Clams:

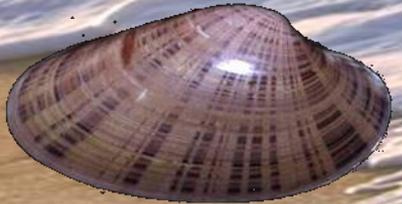
- Buckets stocked with 40 SRV (30 mm SL)
- Bucket tops covered with netting

Harvest:

- Harvested after 6-month period
- Production characteristics measured



1st Bucket Study: 2010-11

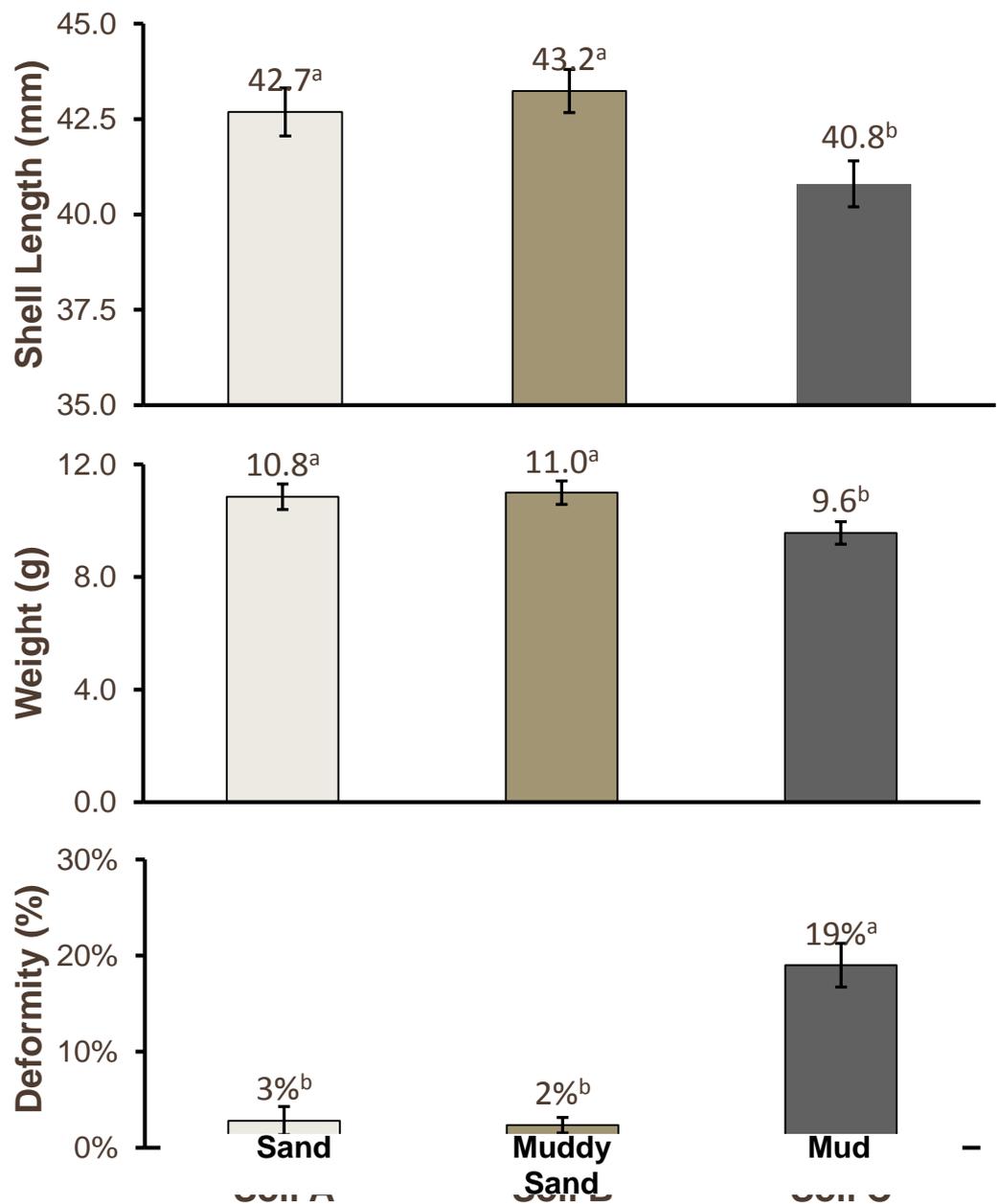


1st Bucket Study: 2010-11

Results

- All growth parameters similar between Sand and Muddy Sand
- Reduced weight and length in Mud
- 10x greater deformities in Mud
- Survival data acceptable:

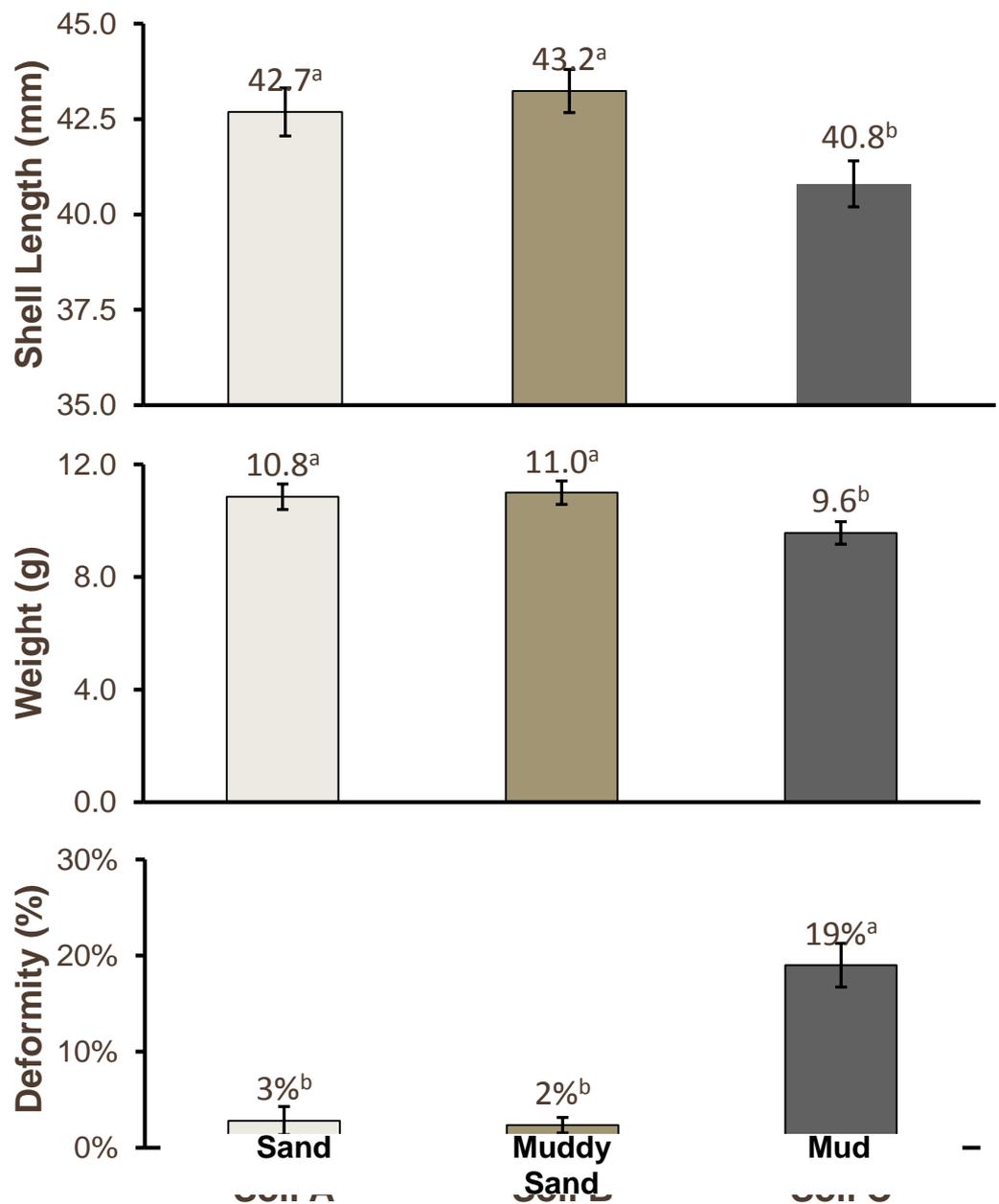
Sand:	100%
Muddy Sand:	94%
Mud:	98%



1st Bucket Study: 2010-11

Results

High OM, low sand may inhibit desired SRV growth



2nd Bucket Study: 2011-12

Objective

- Refine understanding of sand and OM affect on SRV growth

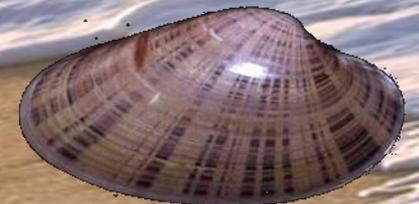
Methods

Soil:

- Repeat *in situ* bucket approach
- Sand and OM proportional, so engineer soils w/ controlled sand content
- Engineer six soils ranging from 85% - %100 sand
- Place each soil in four replicate 3 gal buckets



100% 97% 94% 91% 88% 85%



2nd Bucket Study: 2011-12

Methods cont.

Clams:

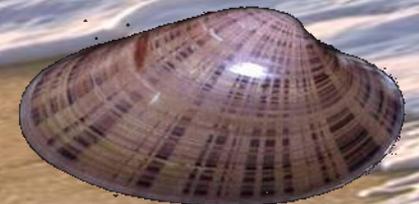
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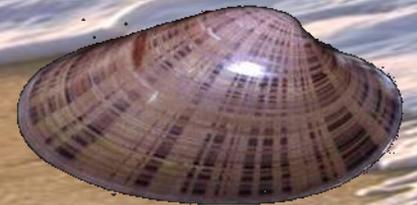
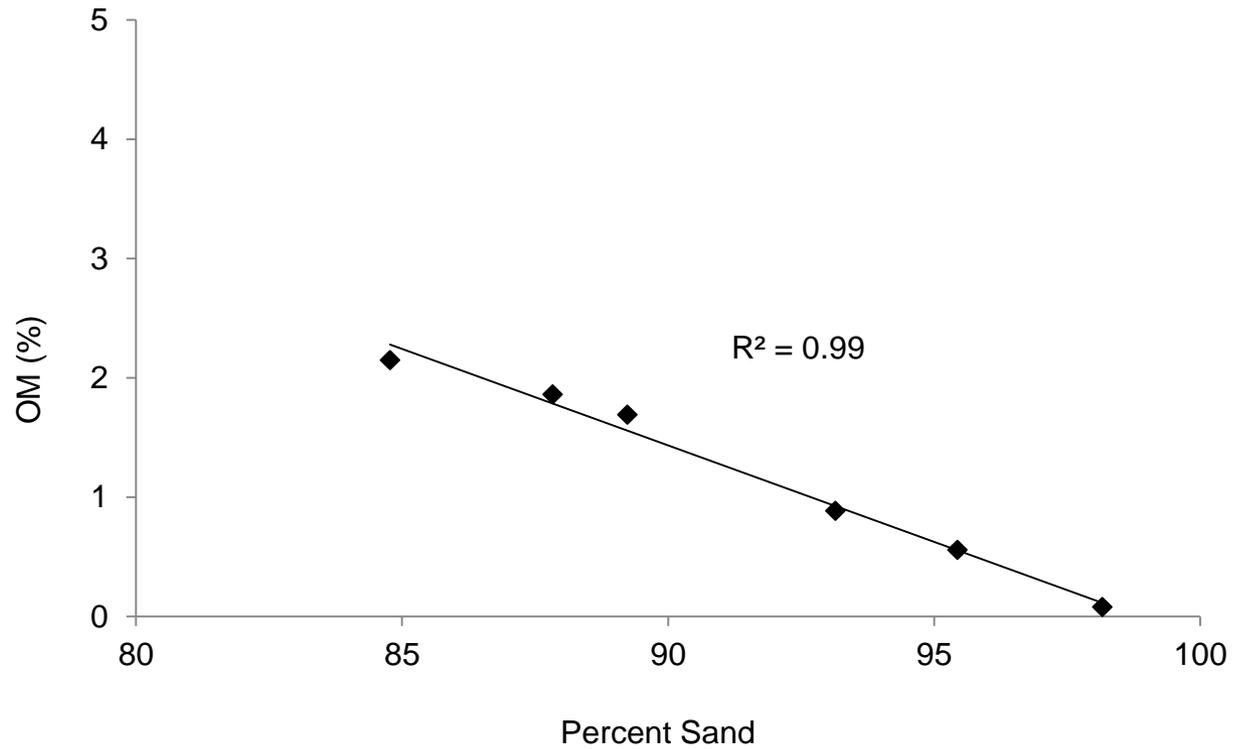
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2nd Bucket Study: 2011-12

Results

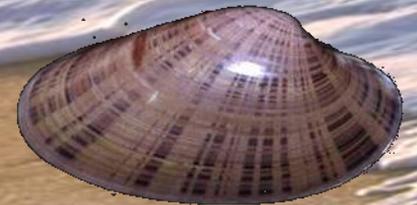
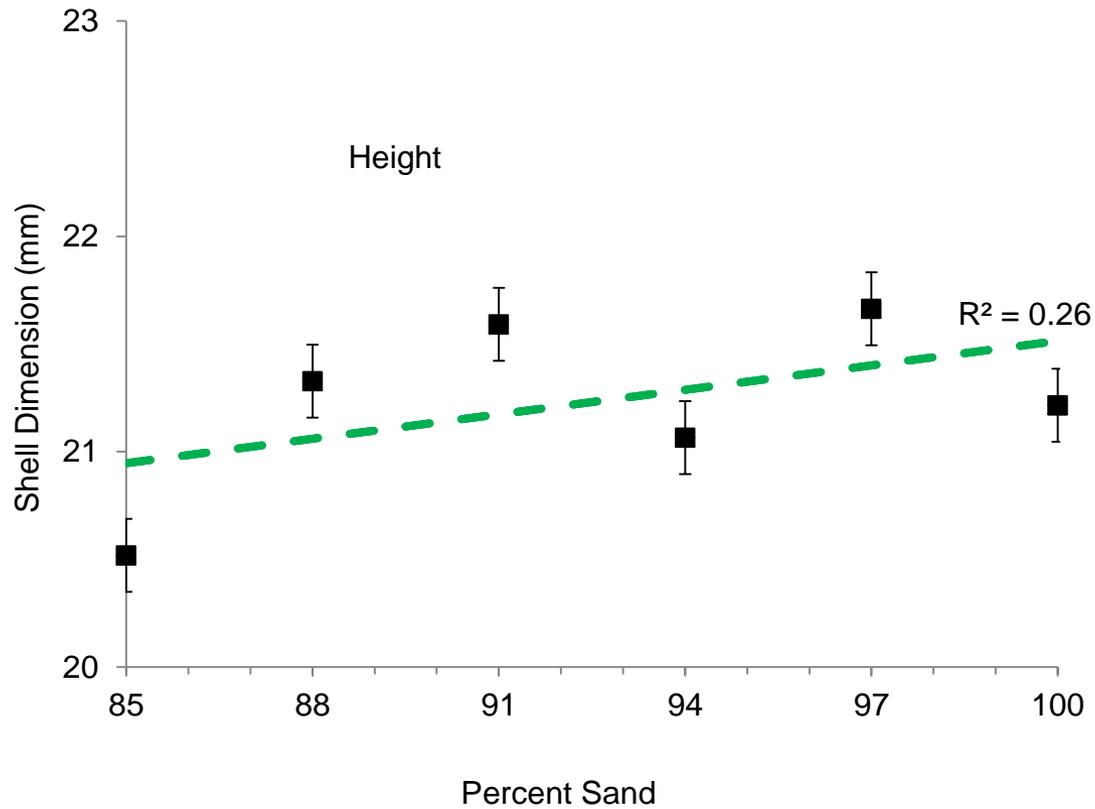
More sand = less OM



2nd Bucket Study: 2011-12

Results

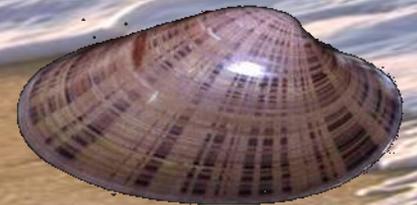
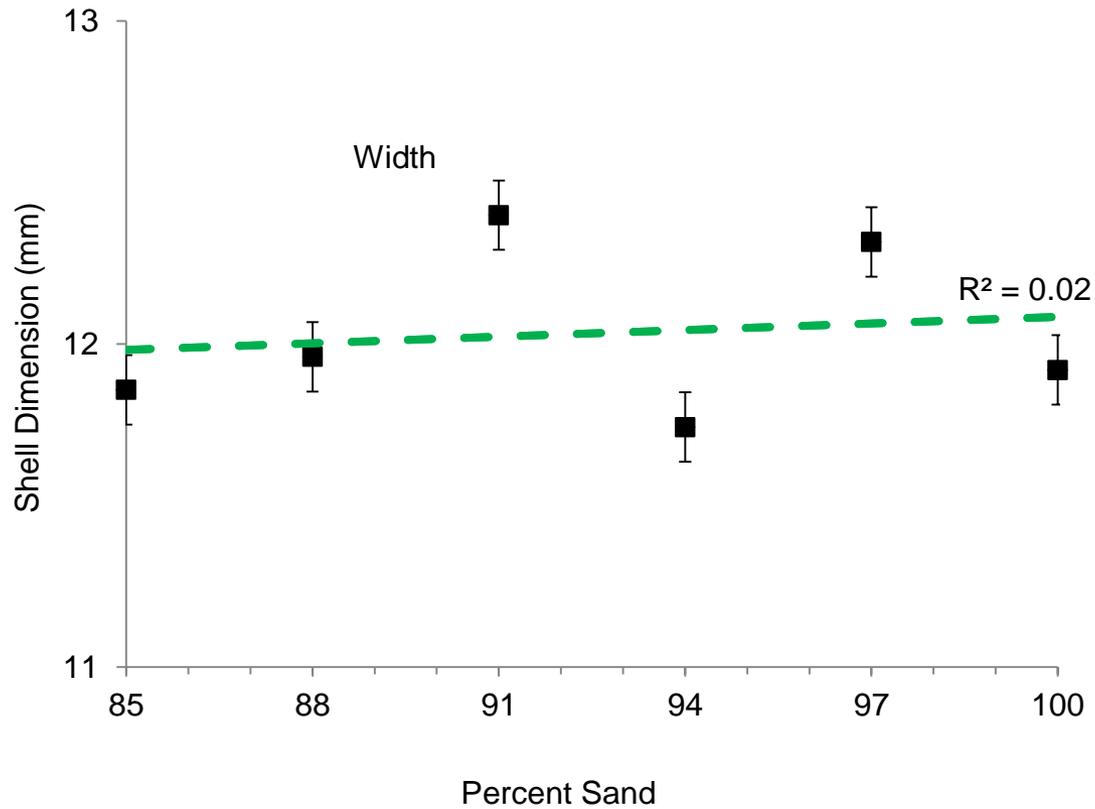
More sand = larger shells



2nd Bucket Study: 2011-12

Results

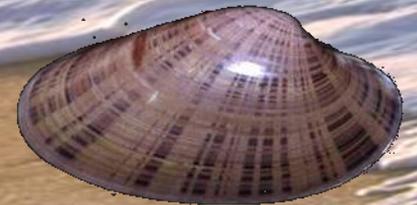
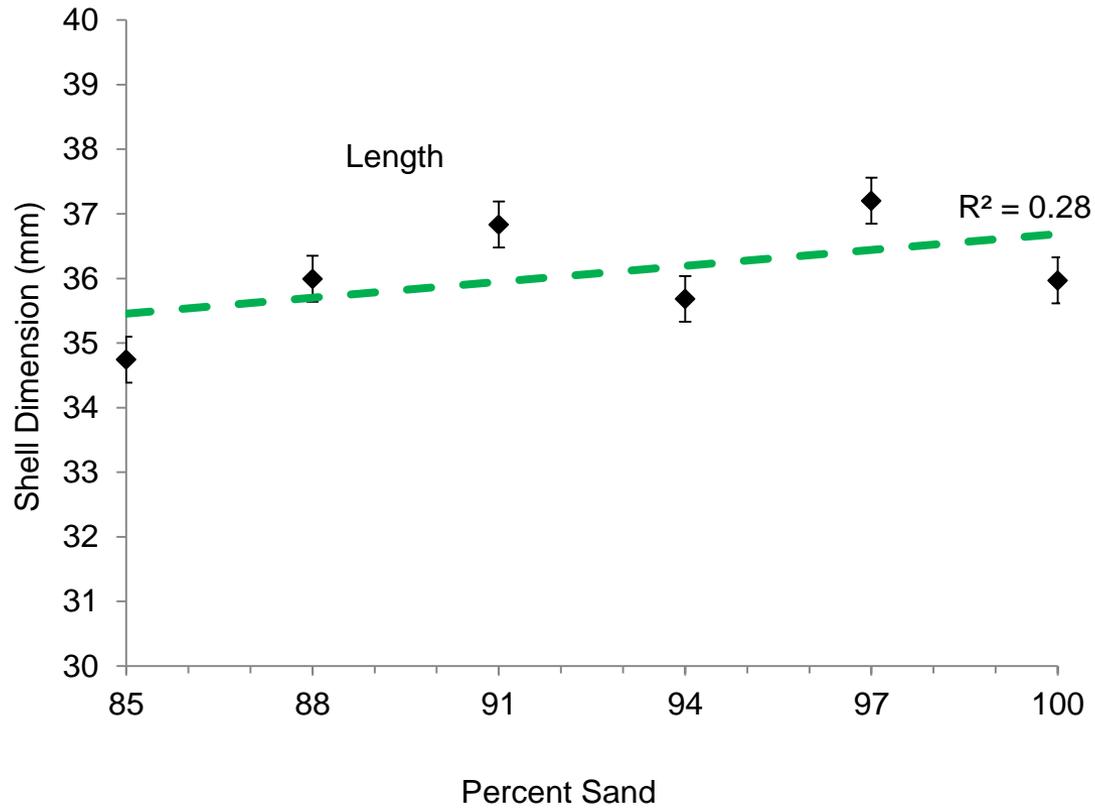
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2nd Bucket Study: 2011-12

Results

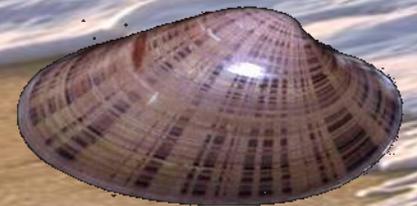
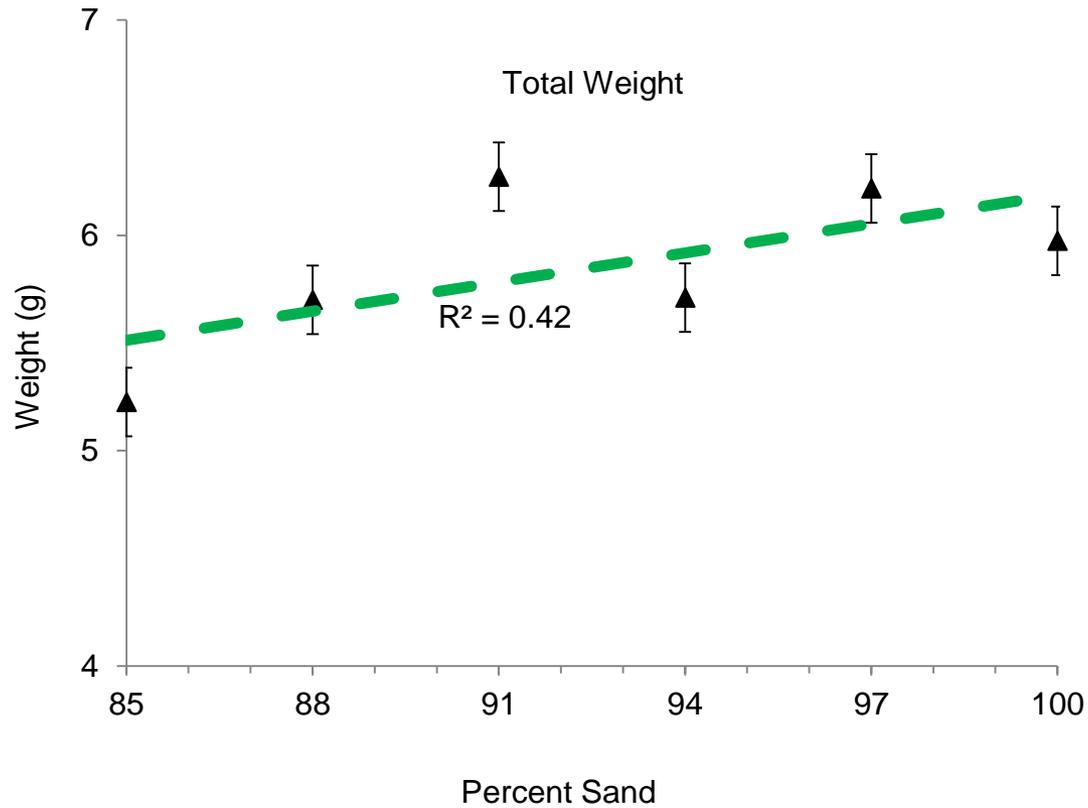
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2nd Bucket Study: 2011-12

Results

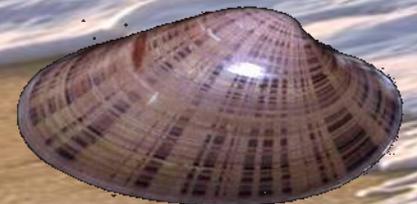
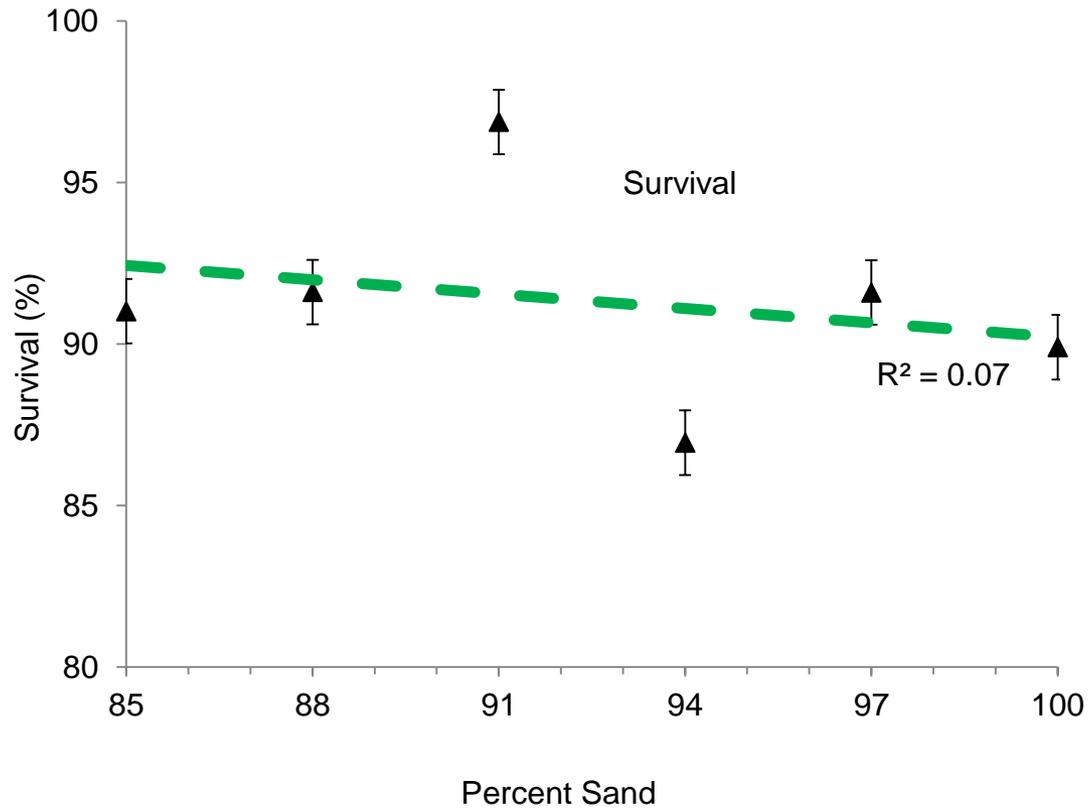
More sand = greater TW



2nd Bucket Study: 2011-12

Results

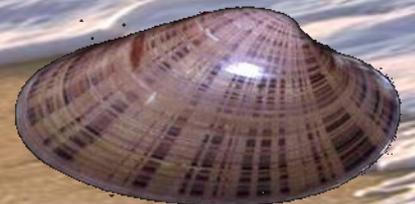
More sand = no change in survival



Conclusions

Investigate relationship between soil properties and sunray venus (SRV) growth

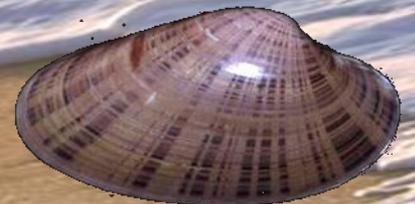
- Soil OM and % sand are related metrics (use either)
- SRV grow larger in size and weight in sandier soils (lower OM)
- Above 85% sand (3% OM), SRV growth is desirable: size/weight are high, mortality is low, and deformities are minimal



Soil Recommendations for SRV

Develop soils-based guidelines for selection of future SRV culture lease sites

- Sunray venus clams should be planted in the sandiest soil available.
- Soils above 85% sand (< 3% OM) are well suited to SRV cultivation
- Loss on Ignition could provide rapid assessment of soil properties critical for SRV growth



Soil Recommendations for SRV

Develop soils-based guidelines for selection of future SRV culture lease sites

Mud



Marginal

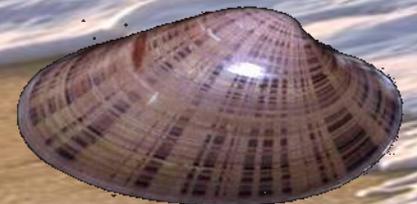
Muddy Sand



Better

Sand

Best



Questions?

SHELLFISH AQUACULTURE
RESEARCH & EDUCATION
FACILITY

Thanks to
ALLEN BOYD

Cedar Key, Florida

• GEORGE KIRKPATRICK • SAMMY YEARTY