



DESIGN AND COMPREHENSIVE PLANNING OF AN ALASKAN OPTIMAL INTERMODAL FREIGHT CONTAINER-BASED SHELLFISH SETTING AND PRE-NURSERY SEED BOOSTING SYSTEM.

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Oysters

Why?

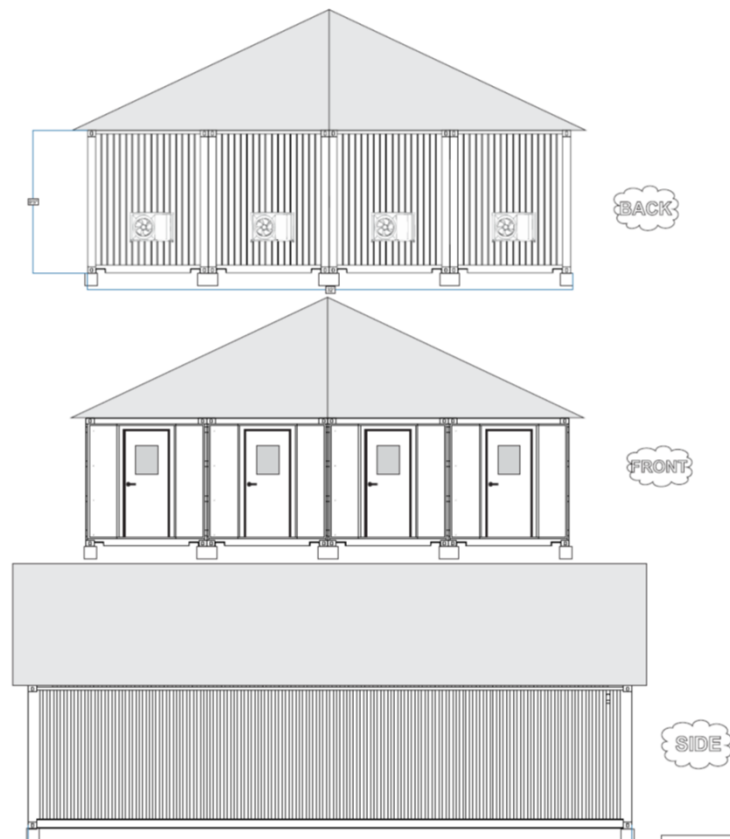
- ▶ Alaskan farmers have attempted to source 3mm and larger seed, but have had very limited access.
- ▶ Having larger seed available at the perfect time of year to optimize the limited growing season.
- ▶ Having larger seed increases the through put to ½ inch seed in the FLUPSY inside the first growing season.
- ▶ Having the ½ inch seed going into farming equipment can take many months off growing the oysters to market size.
- ▶ Containerized seed system allows for shipping remote locations and ease of moving if required.

Design

- ▶ One container will be for water filtration, water heating, water storage and maintenance/storage area.
- ▶ Two containers will be for algae production. One will have the algae lab and 19 x 500L continuous harvest algae bags. One will just have 29 x 500L algae bags.
- ▶ One container will be for oyster seed production, comprising of 3 weller tank systems with a total of 9 bins and a 60 bottle upweller system.



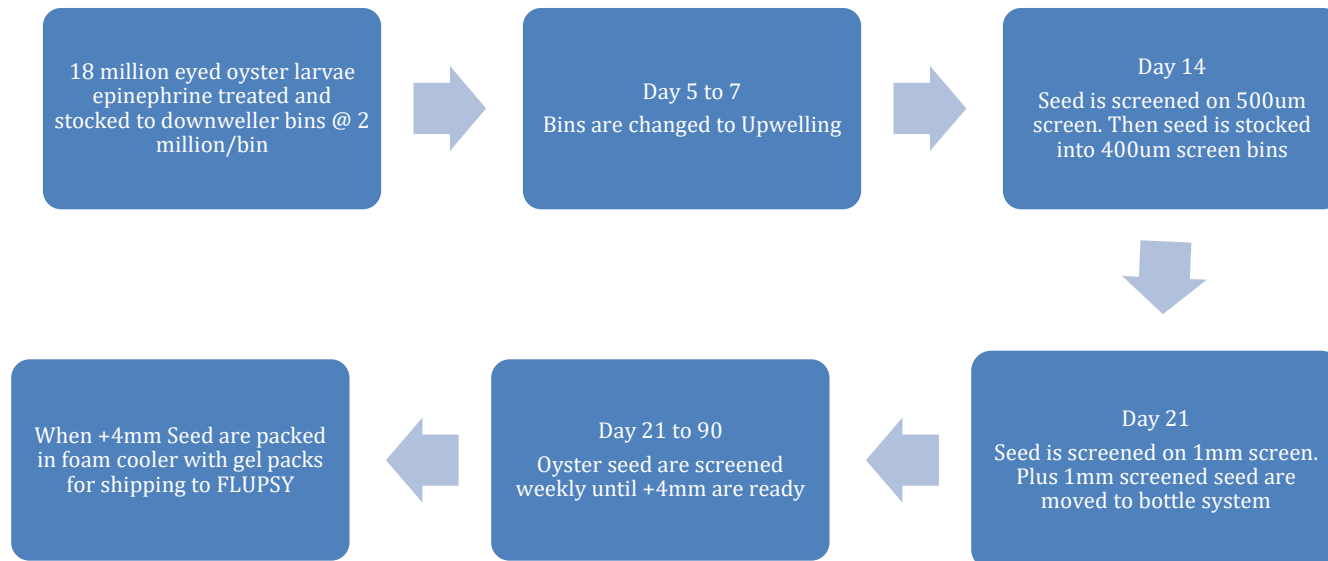
Outside Of Container System



Seed Production

- ▶ The container system is designed to take ready to set oyster larvae from hatcheries in Hawaii, California or Washington and set them using epinephrine in the Alaskan location.
- ▶ Seed production then begins in the container system with set seed going from down weller bins, to up weller bins and then into the seed bottle system.
- ▶ The container system production capacities are 2.7 million 4mm screened oyster seed per single run.
- ▶ There is the potential to do multiple runs during the season to increase production.

Production Flow



Capital Costs

- ▶ The intermodal freight container based shellfish setting and pre-nursery seed boosting system design is made up of a 4 x 40ft High cube containers with all equipment required to operate the nursery facility.
- ▶ The intended use of the hatchery is to produce 2.7 million +4mm oyster seed during a 5-month season.
- ▶ The total capital cost of equipment and set up for the container system is estimated to cost **\$716,740.67**

Operating Costs

- ▶ The operating costs of the container based shellfish setting and pre-nursery seed boosting system are based experience in running commercial hatcheries.
- ▶ It is estimated 2 full-time aquaculture technicians, and 1 part time maintenance staff member would be required to operate the facility for the 5-month season. The total includes taxes and benefits.
- ▶ The water heating system for the hatchery is a heat pump system that uses electricity and is extremely energy efficient.
- ▶ Property taxes are based on estimated property value and the property tax rate on Prince of Wales Island.
- ▶ The estimated annual operating cost is **\$189,980.81**

Conclusion

- ▶ The containerized seed system was completed with technical designs, capital and operational costing.
- ▶ Outreach was conducted to relevant communities in Alaska.
- ▶ The containerized seed system has the ability to bolster seed production for the specific needs of the Alaskan oyster industry.
- ▶ The main value of growing oyster seed to the 4mm size is to take a substantial amount of time off the production of market size oysters.