Company History

- Incorporated in 1997
- Building our reputation by constantly working to improve the equipment, materials and techniques being used in the aquaculture industries.
Topics for Discussion

- Sourcing Seed
- Grading
- Socking Choices
Seed Collection and Grading

- Seed collection and grading has many benefits including a consistent size product at harvest, varied harvest timelines with seed size grading and reduced handling costs by separating and grading the mussels at a smaller size and overall weight.

- Grading and re-socking enables the farmer to achieve consistent yields in terms of mussel size and count per meter which results in a more valuable crop at the market (processing) grading stage.
Sourcing Seed

- A very small percentage of growers buy seed, the majority depend on collecting their own.

- Seed supply can become a major bottleneck for a mussel operation.

- Seed collection is dependent on various factors.
  - Duration and timing of the settlement period.
  - The number of viable larvae produced.
  - Retention of larvae within the system.
  - Mortality, and predation.

- The selection of a site for the collection of seed is equally as important as the selection of a grow-out site.

- The proper choice for a suitable seed collector substrate is critical.
Growers have tried many different materials in the search for the ideal seed collector substrate. Used rope, old socking material, and worn out finfish netting have been used with limited success but newer materials such as webbing, fuzzy rope or artificial seaweed, have had better success and in some cases have greatly enhanced seed collection. Whatever the material used, the collectors are usually hung on the back lines just before the spat are expected to settle.
Grading Seed

Varying from site to site the collectors are normally harvested once the shell size is large enough to be socked, or when the timing of the socking best suits the growers needs. When the seed has been stripped from the collectors it is loaded into a mechanical grader. The grading machine cleans and sorts the seed mussels into three or four sizes depending on the type of equipment used, and preference of the individual grower.
Grading Machines

Surprisingly, seed grading has still not been recognized in many areas. Where it is practiced there are definite gains in efficiency with higher yields and less labour.

Grading and re-socking enables mussel farmers to achieve consistent yields in terms of mussel size and count per meter which results in a more valuable crop at the market (processing) grading stage.
Sockling Choices:

Mussel socking is available in a wide range of sizes made from different materials. Proper choice of socking is one of the most important decisions that mussel farmers make. The right socking choice will increase efficiencies in every stage of the grow out process and ultimately lead to higher production yields. Proper mesh size is determined by the size of the mussels being socked.

There are many styles of extruded plastic socking available. Although most are inexpensive, trial and error has taught growers that the majority of the extruded socking materials offer a limited mesh size selection, a wildly variable stretch in width and length which makes it almost impossible to achieve consistent density of seed. This can also be a problem with cotton continuous socking.

GDI-CB (cotton bisected) mussel socking is a solution to all these problems.
GDI-CB Mussel Socking

The GDI-CB mussel sock is a square mesh consisting of interwoven monofilament and slit film polyethylene with reinforced bands in the sides to increase the strength of the sock and eliminate longitudinal elongation (stretching). Cotton strands bisect the square mesh openings of the polyethylene giving the socks a significant advantage over all other types of mussel socks.

The bisected cotton strands act to contain the mussel seed during socking, handling and transfer but also when tying the socks to the back lines significantly reducing the loss of mussel seed due to shake-out. The cotton strands biodegrade after about three to six weeks, allowing the mussels to easily migrate out of the sock.

GDI-CB mussel socks are color coded for the different mesh sizes for easy identification.
GDI-CB Mussel Socking Common Mesh Sizes

8XXL-CB  COLOR CODE – Blue
7XL-CB   COLOR CODE – Red
6XL-CB   COLOR CODE – Green
5L-CB    COLOR CODE – Purple
4L-CB    COLOR CODE – Black

Mussel Socking Sizes by Average Seed Size and Average Seed Count per Linear Foot

GDI-8XXL-CB  Blue  1/4” Seed  250 / ft  65mm Ø
GDI-7XL-CB    Red   1/2” Seed  250 / ft  52mm Ø
GDI-6XL-CB    Green 1/2” Seed  250 / ft  45mm Ø
GDI-5L-CB     Purple 3/8” Seed  250 / ft  40mm Ø
GDI-4L-CB     Black  1/4” Seed  250 / ft  32mm Ø

Seed size varies by site and densities vary by growers objectives.
GDI-CB Mussel Socking  Advantages

The side reinforcement bands and square mesh construction provide significant benefits:

The side reinforcement bands on GDI socks fixes the sock length and diameter. This also increases the sock strength which is frequent problem with other mussel socks. Since the sock lengths do not change and the mesh remains open even after the mussels have migrated out of the sock a better structure is created for mussel byssal attachment with significantly reduced mussel fall-off.

Other types of mussel socks do not have a fixed length. When the mussels migrate to the outside of the sock there is nothing inside the sock to maintain the diameter, as a result the mesh cells close longitudinally and the mussel sock elongates causing major problems for growers in shallow water. Also, when the mesh of these socks closes in a lengthwise direction it creates a rope like structure with very limited area for mussels to attach. The fixed cell construction of GDI socks ensure that these problems do not occur.

Mussel socks that do not have a fixed mesh size stretch vertically and horizontally making it impossible to achieve proper stocking density. The sock tube size (diameter) on GDI mussel sock remains consistent during the socking operation providing consistent mussel counts and even stocking densities while decreasing time, labor and eliminating guesswork.

Customized production lines and sewing machines allow us to supply our customers with bales of 500 or 1,000 socks pre-cut to specific lengths and sewn closed at one end. The socks are ready to use reducing material requirements, time and labor.

When compared with all other types of mussel socks GDI-CB mussel_socking has provided our customers with improved seed retention, higher harvest yields and reduced labor and material requirements.
GDI-100% Cotton Socking

Go Deep also manufactures a socking from 100% cotton fiber. This type of socking is a continuous tube that is commonly used for the continuous socking method. It is also used as an outer sock for the individual drop method.
Longline Systems

Surface Longline system

The long-line system consists of buoys, backline, mussel socks and anchors. The surface floats, seed collectors and mesh socks are evenly spaced and tied to the backline. Typical longlines are 80-150 metres in length anchored securely at both ends supported by surface floats that are tied at intervals along their length.

The main disadvantage of a surface longline is the fact that it is subject to the dynamic forces of currents, weather, wave action and winter ice. These forces can cause undesirable movement in the system causing mussel falloff, wear and tear and in some cases destruction of the system components.

Longline technology has been successfully adapted and improved for use as a submerged system.
Submerged Longline System

The backline, floats and socks on a submerged longline system are can be anywhere from 5-60 feet and in some cases up to 100 feet below the surface allowing the system to be less affected by the weather, wave action and ice.

This system also has the added advantage of being less visually obstructive in the sense that only the marker buoys are visible from the surface.

Longline technology is quite simple and very efficient, but requires quality components and detailed planning.

Start up can be a huge undertaking without the proper experience so good advice is critical for the new farmer.
Large Mussel Grow Out Operation
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## Mussel Production by Province in Metric Tonnes

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Information obtained from:
Canadian Aquaculture Industry Alliance website
http://www.aquaculture.ca/files/production-markets.php
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Eastern Canada
Cape Breton, Nova Scotia
St Ann’s Bay
Englishtown, Nova Scotia Canada
2,500,000 KGS of processed mussels annually

Submerged Longlines

With no visual pollution

St Anne’s Bay, Englishtown Nova Scotia
Thank you!

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