

## Common Handling Practices

### Hanging Preparations for Mussel Grow Out Ropes in the Long Line Process

Coils should be uncoiled in an anticlockwise direction from the centre of the coil preferably into a bulk bag or container to ensure no twist is held in the rope. The rope should be placed as far away from the bulk container as possible when pulling out to allow the rope to settle prior to storage.

Coils can be joined via a simple recommended splice method to form a continuous length. If the mussels are small or light, make sure that the rope is soaked well with

water prior to use. This step is important to reduce buoyancy and allow rapid sinking of the seeded rope.

Once the rope has been thoroughly drenched, the seeding and socking process is completed in preparation to suspension from backbone.

**Note:** Seeding rates are a localized science and are influenced by required harvest timing, sizing and local phytoplankton feed levels in the waters along with tidal flow. Seeding rate

variances range from calm low tidal movement regions of 200-325 spat/mtr to open water 7kg + harvest rates in open water conditions of 350 spat/mtr. Where small shell harvest in less than 12mth cultivation is targeted, seeding rates of 450/550mtr of 20/25mm are common. It should be noted that over seeding can lead to poor settlement rate and spat loss. Seeding rates directly relate to surface area available, yield expectation and feed rates applicable to region.

## Tests verify enhanced yield

Up to 25% more yield per metre for a comparable purchase price...

Because Donaghys Xmas tree rope delivers significantly more surface area per metre of rope, yield is dramatically enhanced through higher settlement rates. Please refer to our cost comparison table to compare annualized costs per metre.

In fact independent research was recently conducted in South Australia and it was found that **Donaghys standard Xmas tree rope had the highest mean settlement for any rope type group** with a score of 528 Spat/Metre, substantially above all other competing brands on the market.

*"It was noticeable in cumulative spat analysis that the performance of the (Competitor Named) product appeared to reach a Spacial Settlement Limitation or Capacity prior to the Donaghys product for all results".*

*Donaghys Xmas tree rope's higher performance factor was even more evident on ropes with previous use and abrasive wear".*

**Timing & density recommendations to maximise yield Spat collection**  
Optimal seed catching (spat collection) occurs when water temperatures fall from summer highs. At around 17-18

Deg C competing organisms are minimized and present less threat of fouling.

**Hatchery transfers**  
Low spat density and poor survival rate appear to be correlated to transplanting in times of high marine growth (where natural fouling occurs).

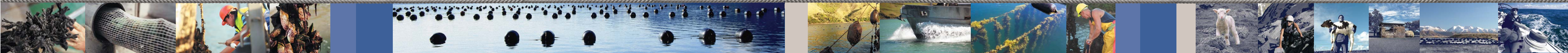
It is recommended that hatchery transfers take place during lower settlement periods ie: late autumn through winter, to allow establishment, migration and growth of spat before competition occurs with naturally occurring marine settling organisms.



Donaghys is a world-leading manufacturer and distributor of innovative and reliable products that provide effective solutions for the rural, industrial, marine and aquaculture markets.



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SPAT ROPE HATCHERY ROPE CROP ROPE BACKBONE ROPE SPAT ROPE HATCHERY ROPE CROP ROPE

SPAT ROPE HATCHERY ROPE CROP ROPE BACKBONE ROPE SPAT ROPE HATCHERY ROPE CROP ROPE RURAL MARINE AQUACULTURE INDUSTRIAL RURAL MARINE AQUACULTURE INDUSTRIAL

Attachment of the seeded rope is by looped lashing of soft construction. This soft construction is easy on hands, gives maximum surface coverage on backbone surface to minimize slippage, and least abrasion resistance to the backbone which is to be preserved for long lasting use.

### Ongoing maintenance of ropes

As the continuous long line system requires the ropes to pass through several handling processes, it is important from a farm management perspective to inspect the ropes regularly. Twist can be imparted into the ropes over time; a simple inspection can check this and remove any twists as they appear. As the ropes are manufactured with a neutral bias any twist can be removed.

The loop depths of seeded grow out rope must account for around 2m clearance and minimal tide conditions to avoid loss of crop growth and or gear damage.

Place the rope in a bulk container on a platform which can be revolved, pull rope up into the air for at least 5 mtrs or as high as possible, then over a wheel then back down into another suitable storage container.

As the rope rises into the air any twists will be evident and show up as a pig tail or knot, revolve the base platform allowing the twist to turn out of the rope.

If needed the rope can be reconditioned during this process by passing through revolving brushes just prior to placement into the storage bag.

**Seeding density**  
Seeding density is critical. Excessive densities may impede growth hence efficiencies are dramatically enhanced with a culture rope of substantial surface area. An historically promoted seeding rate is around 200/metre. In the pristine calm waters of the Marlborough Sounds in NZ seeding rates vary from 150-200 spat/metre and complete the maturation period between 15-24 months, yields are typically around 7kg metre. In the Coromandel where open water farms contend high current and tidal movement, seeding rates are higher

ranging between 195-260 spat/metre and yielding up to 13-14kg metre within 9-12 months.

**Extra surface area per metre dramatically enhances yield**  
Mussels are best seeded at a small size, less than 20mm long as mortality from Bysuss withdrawal is minimized, growth rate is increased as the mussels spread out.

"Heavy mussel spat settlement definitely reduces the ability to settle other marine organisms as their larvae are either consumed or unable

to secure settlement space on the mussel ropes".

In Pt Lincoln SA, least competition is during Winter from May to September. By contrast maximum settlement in New Zealand is generally achieved on Donaghys spat rope mid winter when larval & fouling levels were low. Densities of up to 3000 spat/metre are achieved and although summer fouling becomes evident September - December, Mussel spat survival remains high right through to transfer time in Mid to Late February.

## MUSSEL ROPES

**Origins and evolution**  
The company was founded in 1876 in Dunedin, New Zealand by John Donaghy, a determined and hard working man. His vision left the legacy that is today a name synonymous with rope, cordage, fencing, and extruded and injected plastics in Australasia. The company was built on a work ethic that continues today.

**Managing success today, taking initiatives for tomorrow**  
Donaghys believes in energetic, enthusiastic and accountable managers from diverse backgrounds who seize opportunities and approach challenges with vigour and commitment.

This gives Donaghys a distinct advantage in applying the 'thinking' necessary to finding better ways of doing things and then making them happen.

The company is proud to have many long-term industry-skilled staff as part of its international team. This focus on staff is paramount to ongoing, sustainable performance.

The culture throughout is one of taking responsibility. The aim is to use initiative to improve efficiencies and levels of customer service. The goal is total satisfaction and the means is effective delivery for an ever-evolving and increasingly demanding marketplace.

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# Mussel Rope Range

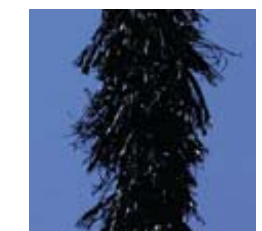
## Crop Ropes



- Open Water Crop Rope**
- Designed specifically for open water farming
  - 18 mths in development and field trials
  - Special Aqua trim reduces Bio fouling
  - "Fibtrim" allows multiple attachment points
  - Highest loop Density available
  - Fully Balanced construction



- Aqualoop Crop HM Rope**
- Cost effective brother to Open water
  - Ideal for high tidal areas
  - Special Aqua Trim reduces Bio fouling
  - "Fibtrim" allows multiple attachment points
  - Fully Balanced construction



- Super Xmas Tree Rope**
- Ideal for sheltered waters
  - Straight trim reduces crop damage during harvest
  - Economical construction
  - High quality UV stabilised yarn
  - Fully Balanced construction

## Specialist Ropes

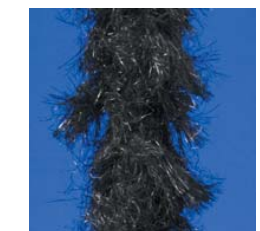


- Lite Loop Rope**
- Specifically designed for high current/tidal areas
  - Light weight core
  - Dense loop trim configuration
  - Produces significantly less drag than standard ropes
  - Reduces fouling on ropes
  - Reduces slumping caused by over settlement
  - Unique "Fibtrim" technology



- Russet Loop Rope**
- Twin Brown high density trims
  - Unique twin trim support process giving short dense loops combined with longer outer loops
  - Exaggerated core diameter to increase bulk
  - Highest surface area available
  - Unique "Fibtrim" technology

## Spat Rope



- Weighted Xmas Tree Spat Rope**
- Superior Spat catching
  - Proven Spat retention
  - Unique Trim construction
  - Straight trim reduced damage to spat during stripping
  - Each individual strand weighted
  - Fully Balanced construction

Xmas Tree Mussel Rope is subject to Patent number NZ 331927

## Hatchery Rope



- Hatchery Rope**
- Braided 8 strand polypropylene with abraded surface attachment points and weighted core
  - Excellent spat collection and retention
  - Easily transportable from hatchery
  - Easily stripped with minimal spat damage
  - Internally weighted core
  - Proven in world leading hatcheries

## Backbone Rope



- AquaTuff Rope**
- Proven in Mussel Farming for over 10 years
  - Designed in conjunction with Mussel Farmers
  - Stronger than standard PP ropes by up to 20%
  - High abrasion resistance
  - New construction to improve abrasion and lastability

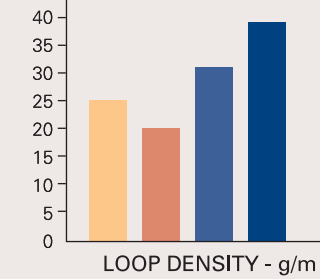
## Lashings & Snoods



- Made of PP to reduce wear on Backbones
- Full range of sizes available
- UV Stable
- Soft yet strong
- Available in either spools or pre-tied

## Grow Ropes

### Surface Loop Comparison

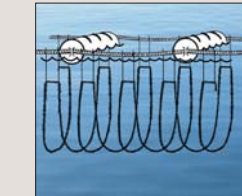
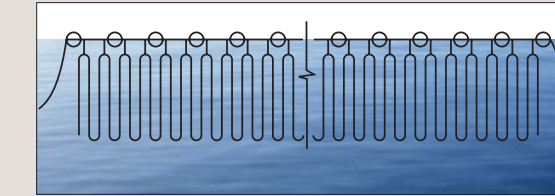


Code	Weight (App)	Tensile Kg (App)	Colour	Size mm	Unit	Length m
<b>3 Strand Openwater Crop Rope</b>						
ROM1410	46	1850	Aqua Trim	14	Coil	320
ROM1411	232	1850	Aqua Trim	14	Bag	1600
<b>3 Strand Aqualoop Crop HM Rope</b>						
ROM1407	48	1850	Aqua Trim	14	Coil	400
ROM1413	242	1850	Aqua Trim	14	Bag	2000
<b>3 Strand Super Xmas Tree Culture Rope</b>						
ROM1403	46	1850	Black	14	Coil	500
ROM1404	186	1850	Black	14	Bag	2000
<b>Lite Loop</b>						
ROM1000	46	1600	Aqua	10	Coil	500
<b>Russet Loop</b>						
ROM1800	54	2000	Brown	18	Coil	320
<b>3 Strand AquaTuff Mussel Backbone Rope</b>						
ROM2402	57	9500	Black	24	Coil	220
ROM2801	78	12500	Black	28	Coil	220
ROM3200	101	16000	Black	32	Coil	220
ROM4000	158	24000	Black	40	Coil	220
<b>Hatchery Rope</b>						
ROM1201	35	2700	Black	12	Coil	200
<b>Weighted Xmas Tree Spat Rope</b>						
ROM1401	43	1500	Black	14	Coil	220
ROM1402	389	1500	Black	14	Bag	1980
<b>Mussel Lashings</b>						
ROM0000	6	400	Black	5	Spool	500
ROM0700	7.6	500	Black	7	Coil	500
ROM0006	17.6	285	Black	1 Ply	2*Coils	2*1200
<b>Mussel Snoods</b>						
ROM0002	7	400	Black	6	4*100/Bale	0.7
ROM0004	7	500	Yellow/Blue	7	3*100/Bale	0.7

# Farm Structure Systems

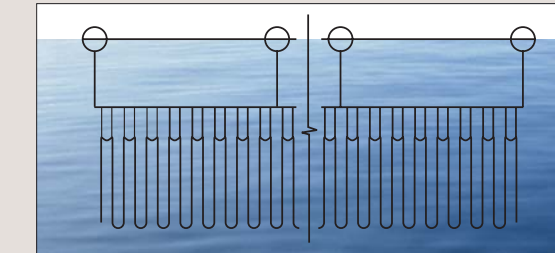
One spat collection (nursery) line is generally required for 4 growing lines. The nursery lines are used to hold spat and to ongrow newly seeded rope until crop on the growing lines finish their 15-24 month growth cycle.

## Continuous Rope System



A series of buoys attached together by AquaTuff, from which Mussel Lashing suspends a continuous line of Donaghys culture ropes.

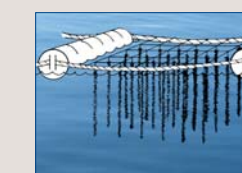
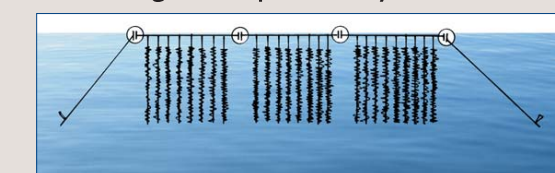
## Subsurface System



The subsurface system is used to drop the continuous system below rough water or to target specific water depths for spat catching. Predominately used in open water farming.

- Maximises water use
- Minimises harvesting time
- Most efficient system available

## Old Single Drop Line System



Single droppers attached to either a single backbone or raft allowing manual harvesting.

- Low production
- Manual harvest method
- Labour intensive

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when everything is on the line



## More mussels per metre

The Donaghys rope when broken down into \$ per year per meter is far more cost effective than any other system. This coupled with the yield output (cost per kg) annualised over 8 - 10 years and you're on a winner.

This means the **Donaghys** rope works out over the life to be **25% cheaper** than the Galicia rope.

As well as from initial cost savings on the ropes the continuous farming system which Donaghys ropes are designed around will give additional cost savings on seeding, catching and harvesting.

Donaghys rope coupled with the continuous long line system will cut farming costs significantly over any other system used today



## Galicia Rope vs Donaghys Rope

- Have medium yield but only last 3 - 4 years
- They need stakes placed in the ropes to prevent the mussels from slumping or falling off
- Tend to be used as single droppers only
- Are cheap initially
- Limited in availability and will become hard to get as second hand net is available compared to demand

- Have high yield and last for 8 - 10 years
- Are designed specifically to be used in the mechanized continuous farming system producing substantially more yield per line than the Galicia system
- Are proven with many years development within the industry
- Can be manufactured to meet the growing market size
- Technically superior

### Cost Analysis

Based on actual costs Sept 2006

Product Formula	Cost per mtr (X)	Yield per mtr(kg) (Y)	Cycles (Z)	Cost/mtr/kg/year (W)
Galicia	80 pesos	4	3	6.6 pesos
Donaghys	320 pesos	8	8	5 pesos

**Your Calculation:**

Galicia	.....	4	3	.....
Donaghys	.....	8	8	.....

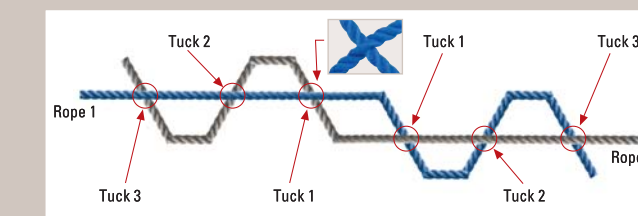
In addition, substantial cost savings can be made utilizing the continuous farming system which Donaghys ropes are designed around.



# Mussel Rope Splicing

## Instructions

- Tape both ends of the rope to be spliced to prevent fraying.
- Make a hole, by separating the lay of the rope, approximately 30cm from the end of one of the ropes and put the other rope through the hole.
- Pull the rope which is through the hole to the same length as the other rope.
- Make a hole in one of the ropes about 6cm from where the ropes join
- Tuck the other rope through the hole
- Continue steps five and six until each rope is tucked into the other rope 3 times making six tucks in total.



## Open Water Aqualoop Breakload Test

Suggested splicing method retains 98% of original breaking strain\*  
\*Test No. DN03/13, Dunedin Laboratory

