

Applications of Coir Fibre Products in Environmental Erosion & Sediment Control and Restoration



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Coir Fibre

- ✦ Abundant, renewable natural resource.
- ✦ Year round production. Coconut fruits are harvested every 6 – 7 weeks.



Coir fibre

- ✦ Fibre processed from coconut husks.
- ✦ Natural by-product from the coconut industry.
- ✦ Inert lignified material.



Advantages of Coir Fibre

- ✦ High strength than most natural fibres.
- ✦ High water holding capacity and support plant growth.
- ✦ Excellent filtering medium.
- ✦ Unpalatable for animals and environmentally safe.
- ✦ Flexible to make a variety of economical finished products.
- ✦ Slow rate of decomposition, last longer.
- ✦ Easily blend with soil and provide mulch.
- ✦ Readily available.

Coir Fibre Products in Construction

Coir products provide environmentally-friendly and aesthetically pleasing applications in erosion and sediment control.

Erosion

The process by which land surface is worn away by the action of wind, water, ice or gravity.

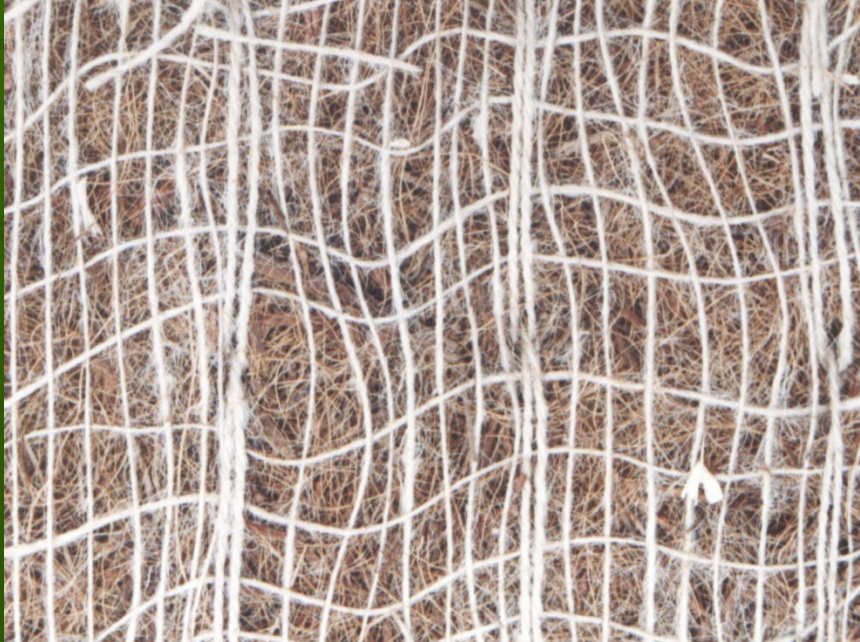


Even though erosion is a natural process, human activities have led to an accelerated level. With increased regulations, erosion is still a big problem in the USA.

Coir Erosion Control Blankets

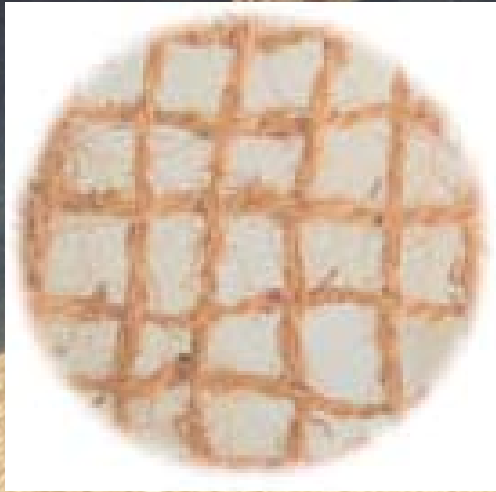
1. Stitched coir mat

Thin layer of coir fibre stitched between two jute nets.

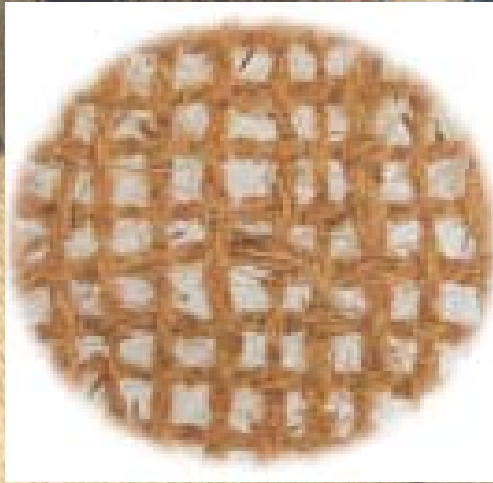


Unit weight:
280 g /sq. m

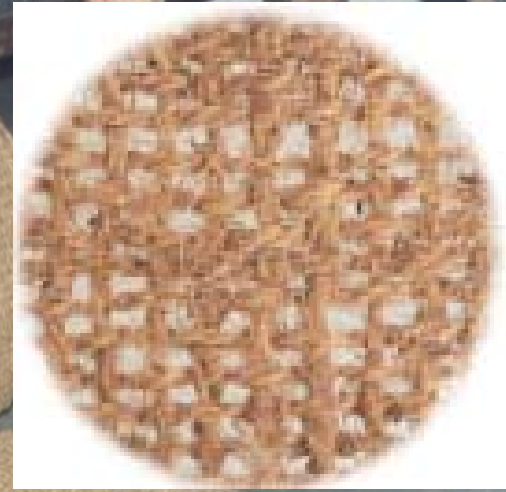
2. Woven Mixed Coir Mats



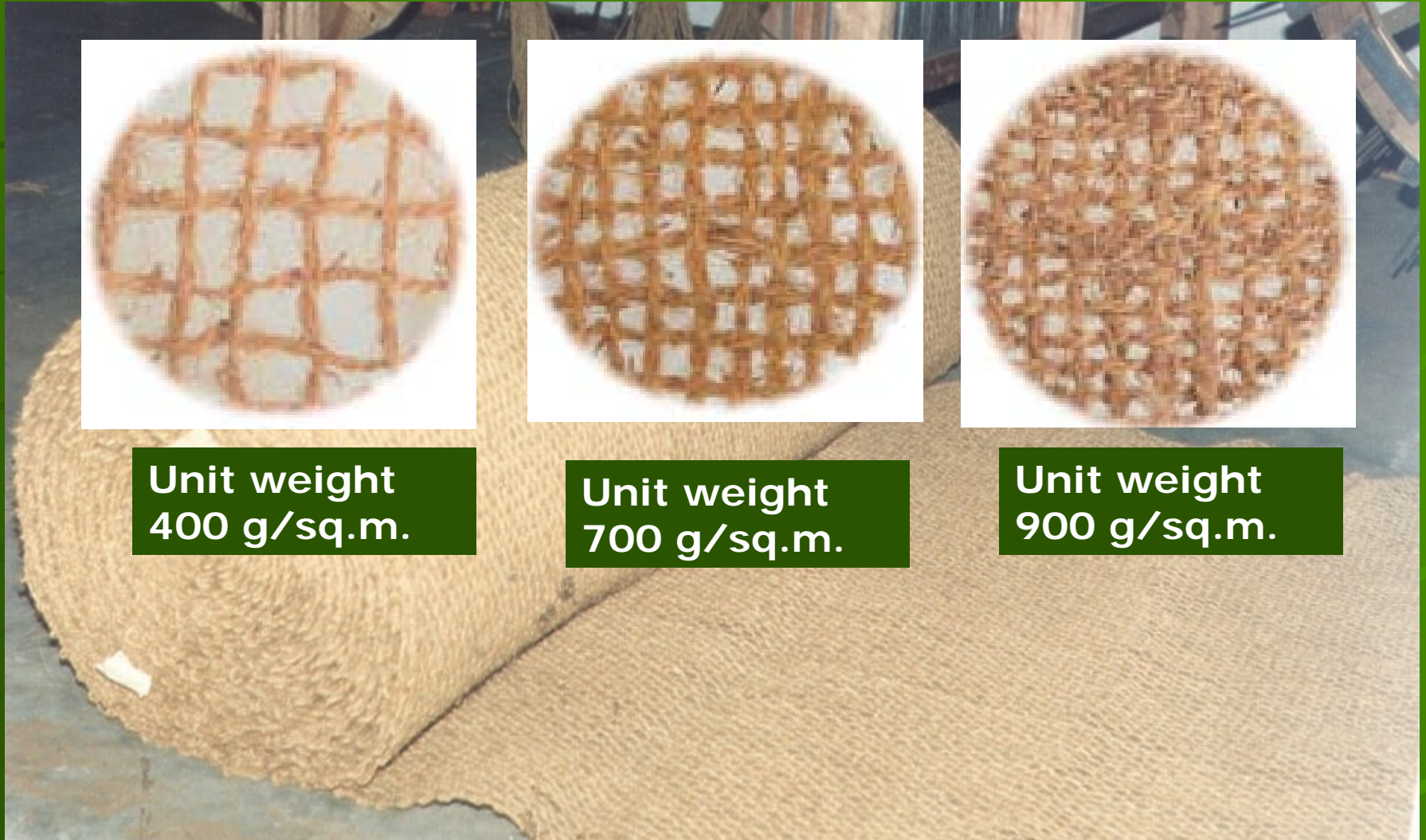
**Unit weight
400 g/sq.m.**



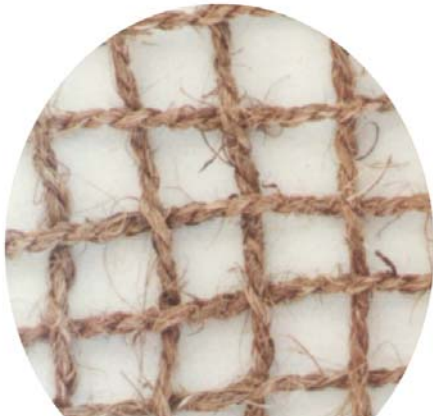
**Unit weight
700 g/sq.m.**



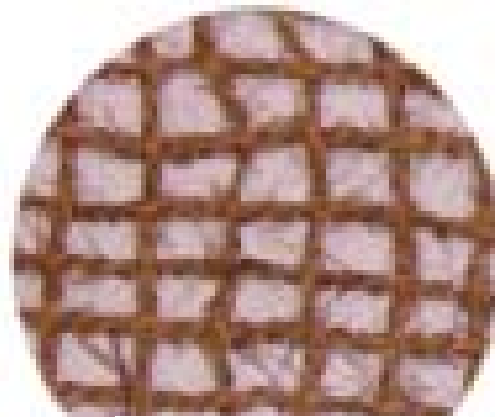
**Unit weight
900 g/sq.m.**



3. Woven Bristle Coir Mats



**Unit weight
460 g/sq.m**



**Unit weight
600 g/sq.m**



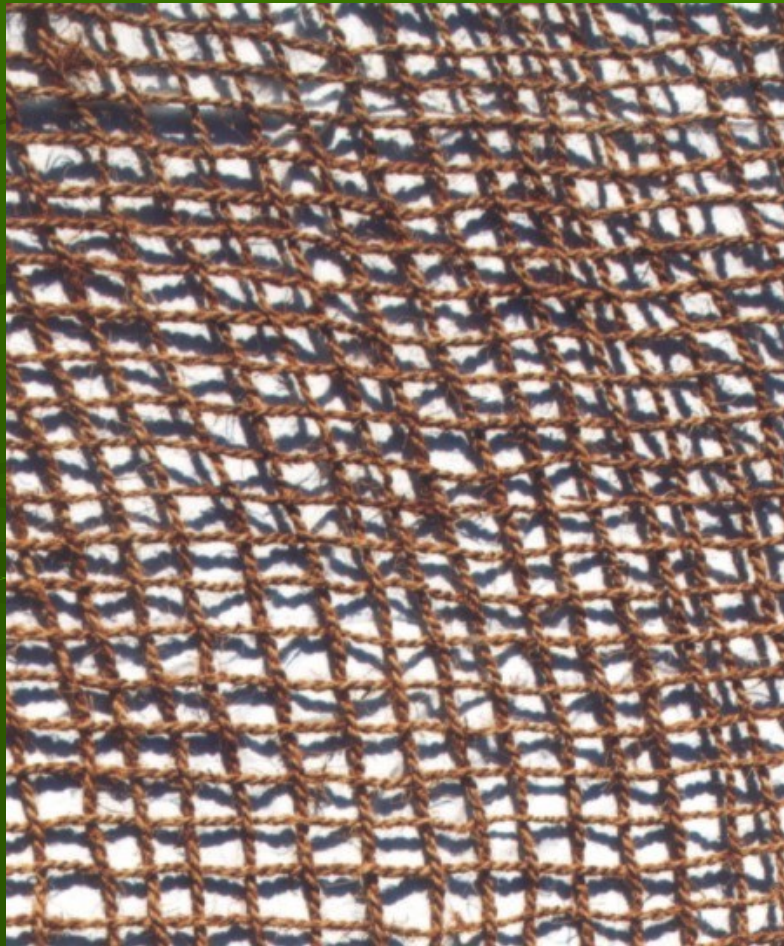
**Unit weight
780 g/sq.m**



**Unit weight
980 g/sq.m**

Bristle coir mat

Dark brown color



Mix coir mat

Light brown color



Performance of Woven Coir Mats

- Unit weight as well as the open area of blankets are important.

Product A



Unit weight
600 g/sq. m.

Product B



Unit weight
700 g/sq. m.

Product C



Unit weight
780 g/sq. m.

Applications of Coir Erosion Control Blankets

1. Slope Stabilization



Slope stabilization



2. Streambank Stabilization



Streambank Stabilization



Streambank Stabilization



Streambank Stabilization ..



Streambank Stabilization ..



After installation

After one year



Streambank Stabilization ...



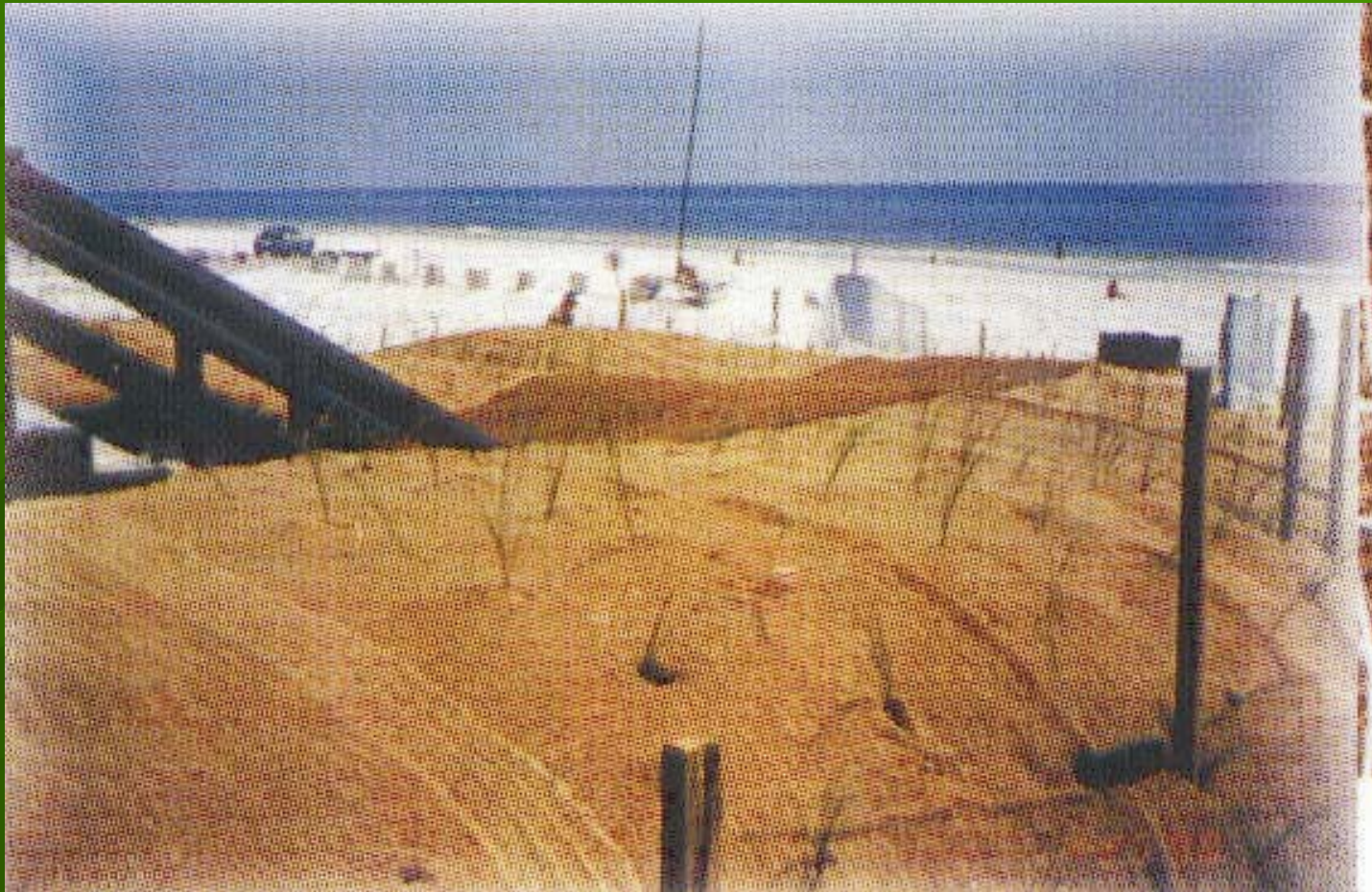
After 8 months



3. Channel Restoration



4. Beach and Wetland Restoration



Advantages of Coir Erosion Control Blankets

- Hold moisture and support vegetation growth.
- Provide strong protection.
- No plastic nets to interfere.
- Aesthetically pleasing applications.



Sediment Control

- ✦ Sedimentation is the process where eroded soil particles settle out.
- ✦ Sediment is the main source of water pollution.



Coir Sediment Control Products

1. Coir wattles

Mattress coir fibre is filled lightly in a 5 cm x 5 cm coir twine net.

Available in 15 cm, 23 cm and 30 cm diameter rolls.



2. BioD-SiltCheck™

Coir SiltCheck

A Patented Product

Mattress coir fibre is filled lightly in a coir twine net with filter aprons on both sides.

Available in 23 cm and 30 cm diameter rolls.



Filter aprons

3. BioD-SuperWattle™

Coir Super Wattle

A Patented Product

Mattress coir fibre is filled lightly in a coir twine net with filter apron on one side.

Available in 23 cm and 30 cm diameter rolls.



Applications of Coir Sediment Control Products

- 1. Check dams**
- 2. Curb inlet protection**
- 3. Perimeter sediment control**
- 4. Slope reduction devices**
- 5. Shoreline sediment control**

1. Check Dams

Coir wattles, coir silt checks and coir super wattles are excellent check dams in channel restoration.



Coir wattle check dam



Coir siltcheck check dam

2. Curb Inlet Protection

The 23 cm diameter, 4.6 m long coir wattle is excellent to filter sediment in curb inlets.

No special equipment is needed for installation.



Twine loops



Concrete blocks



3. Perimeter Sediment Control

Coir wattles and coir super wattles are excellent for perimeter sediment control.

They allow heavy equipment in and out without any problems.



4. Slope Length Reduction Devices

Coir wattles, coir silt checks and coir super wattles are excellent to break the water flow in slopes.



5. Shoreline sediment control

Coir wattles, coir silt checks and coir super wattles are excellent to protect lakes and reservoirs from sediment pollution.



Advantages of Coir Sediment Control Products

- ✦ Filter sediment effectively.
- ✦ Completely biodegradable, no need for removal at the end of construction. Reduce costs.
- ✦ No synthetic materials to interfere with wildlife activities.
- ✦ Work well with heavy equipment.
- ✦ Provide esthetically pleasing applications.

Coir Restoration Products

The increased impervious surfaces such as paved roads and parking lots have created a heavy runoff flow of water to rivers, lakes and reservoirs. This has created a great threat to streambanks and shorelines.



1. Coir Logs

- ✦ Mattress coir fibre is filled tightly in a 5 cm x 5 cm coir twine net.
- ✦ Available in 30 cm, 40 cm and 50 cm diameter rolls.

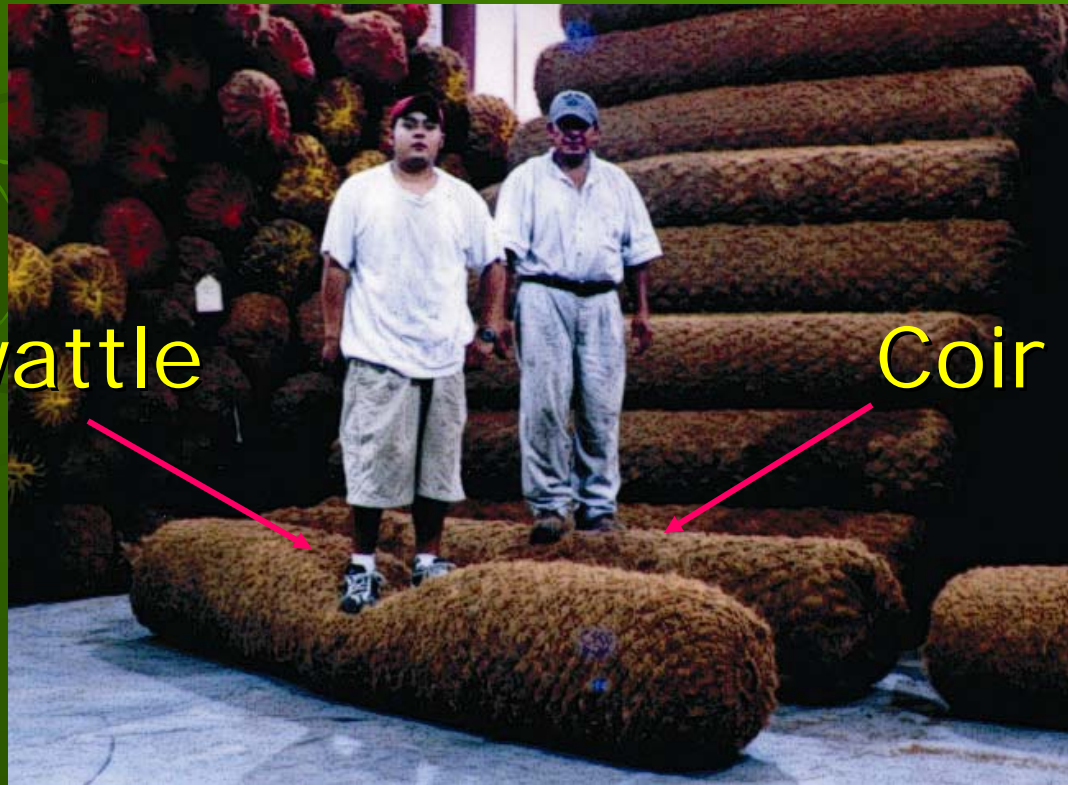


Difference Between Coir Logs and Coir Wattles

Coir logs provide strong support.
Coir wattles filter sediment effectively.

Coir wattle

Coir log



1. Coir Logs on Streambanks



2. Coir Logs on Marsh Restoration



BioD-Block™ Coir Block System with Attached Fabric

A Patented Product

Available in 30 cm and 40 cm tall blocks

Top fabric



Bottom fabric

Coir block

Connecting Coir Blocks

Male end



Female end



Connected blocks

Connection



BioD-Block System on Slopes



BioD-Block System on Streambank



BioD-Block System on Streambank ...

Multi-layer application



BioD-Block System on Streambank ...

Vertical application



After installation



8 months later

Advantages of Coir Block System

- ✦ Provides constant layer heights.
- ✦ Makes easy construction of fabric wrapped soil layers.
- ✦ The thick coir block provides longer and stronger protection to soil wraps.
- ✦ Unique connection provides strong, continuous sections.
- ✦ Reduces installation costs.
- ✦ Aesthetically pleasing applications.
- ✦ Coir fabrics provide stability to constructed soil mass until root structure is developed.

3. Coir Pillow

- ✦ 5 cm thick pad of mattress coir fibre in a coir twine case.
- ✦ Standard rolls are 1 m wide, 5 m long.



Coir pillows to create quick wetlands

- ✚ These can be pre-vegetate nurseries



Transport to site for quick restoration



◆ Need extensive preplanning.

Floating Islands



Improve fish habitats and water quality.

Coir Pillows for Floating Islands



- ✦ Provide medium for plant growth.

Coir Pillows on Gabions



✦ Improve natural beauty.

Effectiveness of Coir Products Compared to Synthetic Products

- ✦ Traditionally, erosion control was achieved with Geo-Synthetic materials.



With time synthetic mats break into pieces.

Effectiveness of Coir Products Compared to Synthetic Products

- Vegetation comes easily through coir mats than synthetic mats.



Effectiveness of Coir Products Compared to Synthetic Products

- ✦ Traditionally, sediment control was achieved with Geo-Synthetic materials.



These products often fail creating more problems

Traditionally restoration was done with rock rip-rap.



- ◆ Aesthetically not pleasing
- ◆ No support for biological life
- ◆ Fish kills during summer months due to low D.O.
- ◆ Increase heat reflection
- ◆ Lead to unbalanced ecosystem

Coir products are the best tools to protect soil and our natural resources for the construction industry. They provide true green solutions.



Thank you!