Biotics in Soil Restoration & Site Revegetation

Restore – Reveg - Reclaim
NEW SOLUTIONS
FOR THE SAME
OLD PROBLEM
The Biotic Approach Asks…

- Is importing topsoil really needed for establishing vegetation and controlling erosion?
Conventional “Fixes”

• Sit upon the surface and focus more on immediate surface protection from detachment.
Good Erosion Control
• The function of biotic elements is soil improvement.
• They should promote natural microbial activity, and natural topsoil forming processes, the hallmarks of healthy vegetation-supporting soil systems.
Vegetation Performance Failures
Without Biological Function

Vegetation is Unsustainable
Conventional Reactions

Apply Herbicides, Chemicals, Fertilizer & Re-seed
What is Soil?

Composition

- Mineral: 45%
- Air: 25%
- Biotics-Organics: 5%
- Water: 25%
What’s Missing For Revegetation?

Biological Function

45% Mineral

25'

OM
What sources of organic matter are available?

- **Peat Moss** is a great source of organic matter and a favorable growing medium; and a renewable natural resource.

- **Compost** may contain some nutrients however, frequently it is not consistent in texture, quality, and may import contaminants such as hydrocarbons, metals, pathogens, pesticides and weeds.
Why Peat Moss?

This photomicrograph of a peat moss particle shows its natural capillary and porous structure (natural sponge). It increases the water and nutrient retention as compared with any other source of organic matter (compost, manure, wood, etc. The peat absorbs water and nutrients and avoids the leaching and loss of nutrients to the environment.

Why is it the most popular greenhouse growing medium in the world?
What are Biotic Soil Amendments?

• 100% Recycled Soil Building Organics
  ✓ Biochar
  ✓ Humic Compounds
  ✓ Degradable Fibers
    ✓ Straw – Jute - Flax
  ✓ Mycorrhizae and Microbes
    ✓ Beneficial Bacteria
  ✓ Water Retaining Organic Polymers

• Hydraulically or Broadcast Applied
DESIGNED USING BIO MIMICRY

Think of it as "innovation inspired by nature." The core idea is that nature, imaginative by necessity, has already solved many of the problems we are grappling with today. Plants, animals, and microbes are the consummate engineers. They have found what works, what is appropriate, and most important, what lasts here on Earth. This is the real news of bio mimicry: After 4.2 billion years of research and development, failures are fossils, and the successes are living all around us!
What Biotics Do

- Restore Biological Function
- Mimic Natural Processes
- Improve Plant Establishment
- Ensure Project Success
- Save Money!
How Biotics Work!
Why Biochar?

- Optimum Microbial Host
- Mycorrhizal-Microbial Interaction
- Soil Structure
  - Water Retention-Filtering
  - Porosity
  - CEC-
  - Permeability
Sustainability: A Challenge

Habitat
Germination

Just Add Water
IT STARTS HERE

Seeds Germination
Case Study: Wyeth OR

- PermaMatrix Applied October 4th 2010
Case Study: Wyeth OR

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Case Study: Wyeth OR

- PermaMatrix Full Native Cover Spring 2011
Case Study: Wyeth OR

- PermaMatrix On Right of Photo
Case Study: Wyeth OR

- PermaMatrix in swale areas established sedge and rush species from seed to mature plants that went to seed head in the 1st year!
Case Study: Wyeth OR

- Spring 2012 No Additional Inputs!
Milner Ridge Manitoba

- Government of Manitoba
- Medium security jail
- 70,000 square meter waste water pond

PROBLEM
- Very sandy material
- Marginal natural topsoil – not reclaimable
Milner Ridge Manitoba

3500lbs/acre
3900kg/ha
Seed and fertilizer added right in the mix
2 weeks later
3 weeks later
7 weeks later
13 Weeks later
14 Months later
Effects of mycorrhizea (a strong root system)
Biotic layer mimics the natural O horizon
Case Study: Stormwater Basin

Poor Drainage and Discharge
Winter 2009

Soils were Screened and reused
January 2010

PermaMatrix used with Native Seed Mix
Feb. 2010

April 2010
Case Study: Stormwater Basin

July 2010

Fall 2010

July 2010

Spring 2012 with no additional inputs to site!
Back to the Start
Take The Challenge

• Agencies
  ✓ Require Successful Natural Processes

• Architects & Engineers
  ✓ Design Sustainable Systems

• Contractors
  ✓ Drive New Technologies

• Advocates
  ✓ Demand Change
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