



A biotic approach to erosion control by building soil without importing topsoil

The Biotic Family:





After Construction

the erosion control part of the project starts.....



- Organic matter is lost (usually due to removal)
- Loss of micro and macro pores (air/water exchange)

The Biotic Family:





AFTER CONSTRUCTION

Conventional Approach to Erosion Control Starts by Adding Topsoil

Ontario Provincial Standard Specifications for Topsoil, 2007

“Topsoil shall be a fertile loam material that is free of roots, vegetation, or other debris of a size and quantity that prevents proper placement of the topsoil. The topsoil shall not contain material greater than 25 mm in size, such as stones and clods”.

“Imported topsoil shall not have contaminants that adversely affect plant growth”.

The Biotic Family:





The Biotic Approach Starts By Asking:

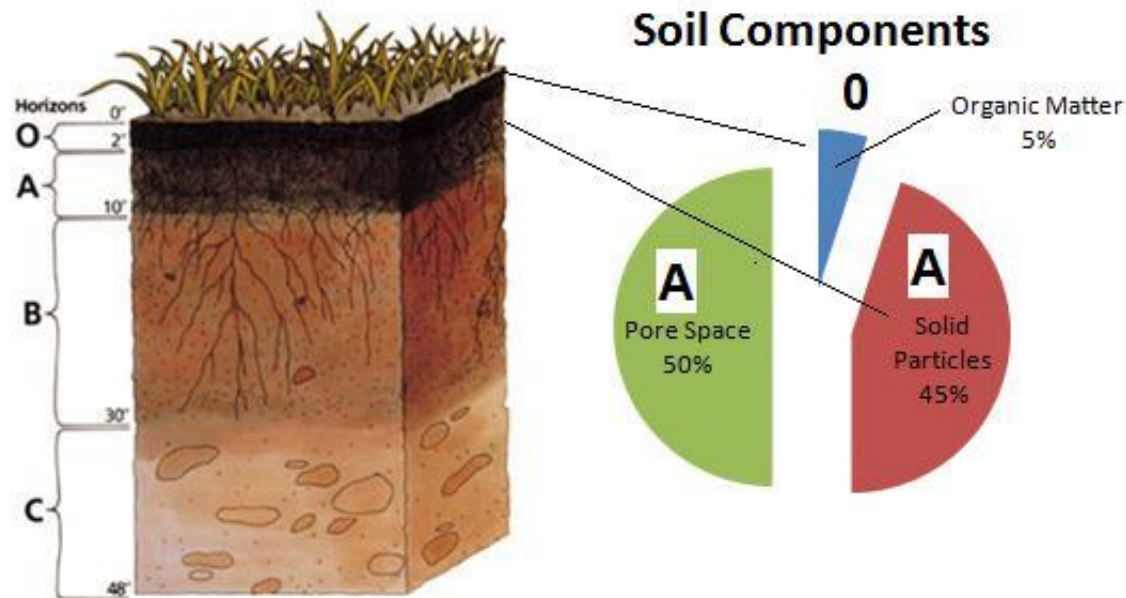
Is importing topsoil really needed for establishing vegetation and therefore controlling erosion?

The Biotic Family:





Natural Soil Profile



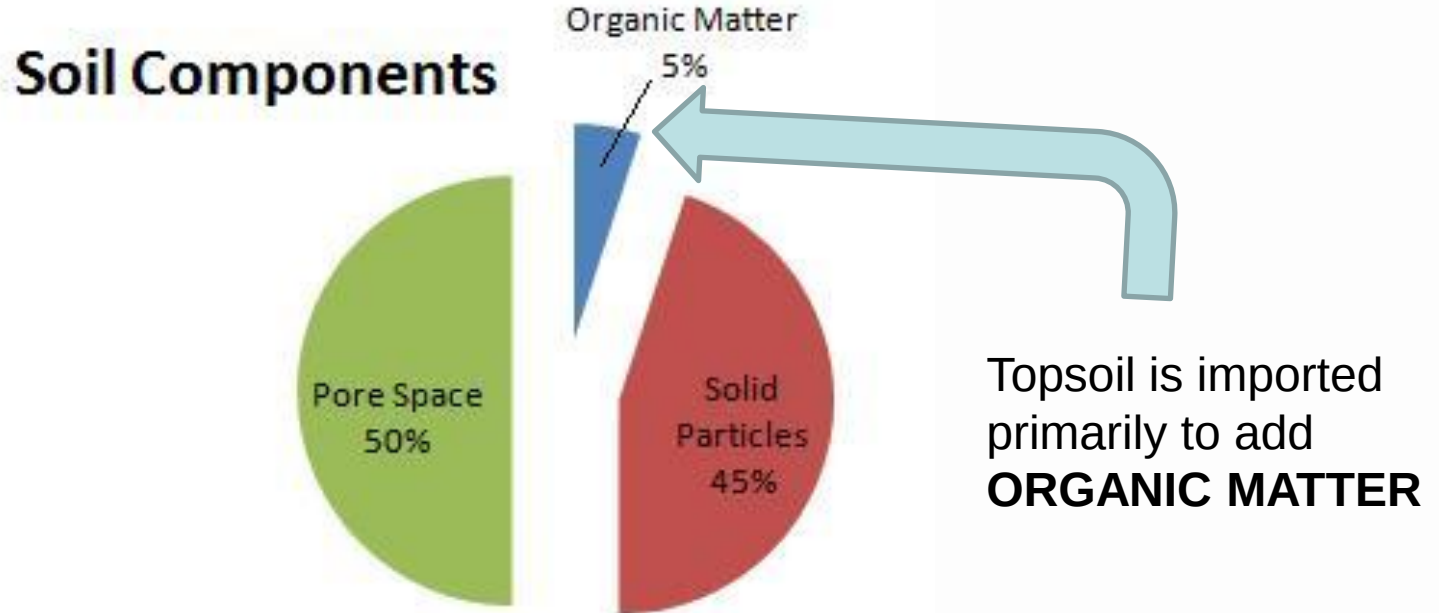
- O) **Organic matter:** Litter layer of plant residues in relatively undecomposed form.
- A) **Surface soil:** Layer of mineral soil
- B) **Subsoil:** This layer accumulates iron, clay, aluminum

The Biotic Family:





Why Topsoil is Added?

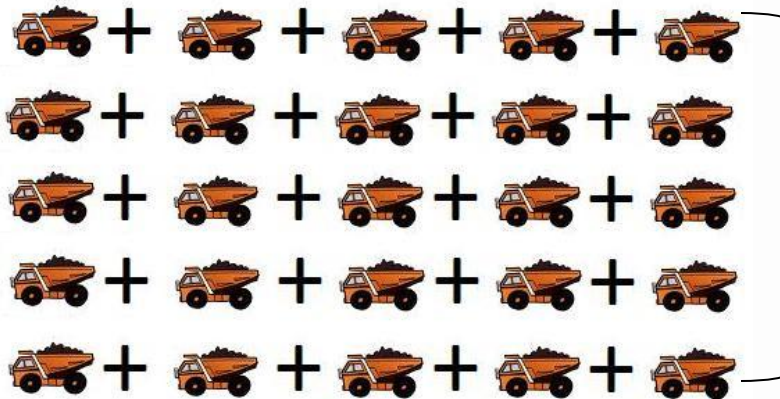


The Biotic Family:





The Ontario Provincial Standard Specifies a Minimum of 5 cm (2 in) of topsoil. To achieve this requires the transport and management of 25 trucks per hectare (10/Acre) loaded with 20 m³ (26yd³) of soil.



Conventional
approach to
Erosion Control



**Biotic Approach to
Erosion Control**
Just what is needed

The Biotic Family:





Biotic Approach

- Amend the existing soil with the right organic matter, fertilizer, and tillage of the soil if needed to improve the physical conditions. By doing this, vegetation can be established without the need for importing TOPSOIL

The Biotic Family:





The Biotic Family:





Biomimicry

The Biotic Family:





The Opportunity

- Save money
- Better environment
- Improved design

The Biotic Family:





Contractors

- Grow their business by growing their knowledge
- Add Value
- Increased market – more spraying.

The Biotic Family:





Engineers

- Getting to green quicker
- Added value proposition for clients
- Get to job completion faster
- Lower client cost.

The Biotic Family:





The Biotic Earth™ Growth Medium Family

- Biotic Earth™ Black
- Biotic Earth™ HGM
- Biotic Earth™ BFM

The Biotic Family:





CASE STUDY

 **VERDYOL**
Biotic Earth™ HGM

The Biotic Family:

 **VERDYOL**
Biotic Earth™ BFM

 **VERDYOL**
Biotic Earth™ Black

 **VERDYOL**
Biotic Earth™ HGM



VERDYOL

Biotic Earth™ HGM

- 70% Straw with FFF (flexible flax fiber)
- 30% Canadian Sphagnum Peat Moss (growth medium)
- By volume

The Biotic Family:

 **VERDYOL**
Biotic Earth™ BFM

 **VERDYOL**
Biotic Earth™ Black

 **VERDYOL**
Biotic Earth™ HGM



Hydro Quebec James Bay

- Northern Canada
- Boreal Forest
- No topsoil
- Short Growing Season



The Biotic Family:





The Biotic Family:





VERDYOL



We just added what was
needed, **THE BEST SOURCE OF
ORGANIC MATTER**



The Biotic Family:

 **VERDYOL**
Biotic Earth™ BFM

 **VERDYOL**
Biotic Earth™ Black

 **VERDYOL**
Biotic Earth™ HGM



The Biotic Family:





The Biotic Family:





The Biotic Family:





One Year Later

A native seed mix was used

- Creeping Red Fescue
- Timothy
- Bent Grass
- Birdfoot Trefoil
- White Clover Barley
- Reed Canary Grass

The Biotic Family:





VERDYOL



The Biotic Family:

 **VERDYOL**
Biotic Earth™ BFM

 **VERDYOL**
Biotic Earth™ Black

 **VERDYOL**
Biotic Earth™ HGM



The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





One Year Later

The Biotic Family:





The Biotic Family:





CASE STUDY

 **VERDYOL**
Biotic Earth™ Black

The Biotic Family:

 **VERDYOL**
Biotic Earth™ BFM

 **VERDYOL**
Biotic Earth™ Black

 **VERDYOL**
Biotic Earth™ HGM



- 60 % Sphagnum Peat Moss
- 40 % Straw with FFF
- Mycorrhizae
- Tricontonal Growth Stimulant
- Micro Nutrients



Bird River Manitoba

Manitoba, Infrastructure and
Transportation Cut Slopes 2003



2250kg/ha or 2000lbs/acre

The Biotic Family:





Black HGM requires erosion protection on slopes 3:1 or steeper. C32 was used for it's longevity.



40 days after seeding

The Biotic Family:





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

Very Erodible Sand





Challenge

- 70,000 m² pond
- \$6.00 per m² to import topsoil = \$420,000
- Plus seeding and erosion control cost





Marginal topsoil layer

The Biotic Family:





The Biotic Family:





3900kg/ha

3500lbs/acre



The Biotic Family:





Seed and fertilizer added right in the mix

The Biotic Family:





Complete Ground Cover

The Biotic Family:





Biotic Approach Building the O Horizon (mimic nature)

The Biotic Family:

VERDYOL
Biotic Earth™ BFM

VERDYOL
Biotic Earth™ Black

VERDYOL
Biotic Earth™ HGM



The Biotic Family:





The Biotic Family:





2 weeks later



The Biotic Family:





3 weeks later



The Biotic Family:





7 weeks later



The Biotic Family:





13 Weeks later



The Biotic Family:





Effects of
mycorrhizea (a strong
root system)

The Biotic Family:





Biotic layer mimics the natural O horizon

The Biotic Family:





Infrastructure and Transportation
Accommodation Services Division
1700 Portage Avenue
Winnipeg, MB R3J 0E1
T 204-945-7532 F 204-945-0908
www.manitoba.ca

July 15, 2009

Mark Myrowich
Erosion Control Blanket
Highway 8 and Vidir Line Road
Riverton, Manitoba R0C 2R0

Re: Milner Ridge Correctional Centre-Wastewater Treatment Lagoon Landscaping

Mark,

On behalf of our Department, I am writing to commend your innovative solution to our landscaping and erosion control issues at the MRCC Lagoon.

As you know, there was significant discussion with the consulting team to obtain the best method of establishing vegetation on the sand berms surrounding the lagoon. Based on the significant erosion during construction, it was recognized that a conventional topsoil/seeding or even a more expensive "staked" sod approach was not viable. The integrity of the lagoon berms is critical to contain the effluent, and a cost effective, yet fail-safe system of erosion control is essential. Your proposal of a hydro-seed/mulch mixture covered with erosion control blanket was cost effective and promised excellent results.

Our expectations with the finished product have been far exceeded. Vegetation growth was rapid and consistent across the entire area. Within several weeks of project completion, we had approx. 100mm of rain fall within a 48 hour period. I contacted our groundskeeper, fully expecting the worst, only to hear that there was virtually no erosion. Growth continues at a steady pace, and I am confident that the critical period for establishment of vegetation is nearly complete.

Thank you again for a job well done.

Harry Schroeder P.Eng. LEED AP
Project Manager

cc: Tim Lasuik, JR Cousin Consultants



The Biotic

Manitoba
spirited energy

VERDYOL
Biotic Earth™ HGM



“Our Expectations of the finished product has been far exceeded”

Harry Schroeder, P.Eng, LEED AP

The Biotic Family:





Manitoba Floodway

- 40 mile channel around the city of Winnipeg
- 30 million cubic meters of excavation
- 2KM stretch of a gravel/clay seam

The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





Commonwealth Stadium



The Biotic Family:





The Biotic Family:





June 20, 2010

The Biotic Family:





July 20, 2010

The Biotic Family:



7/8/2010

Manitoba

Floodway Authority



Unit #7 - 1333 Niakwa Road East
Winnipeg, MB R2J 3T5
Phone: (204) 945-3627
Fax: (204) 945-7599

To: Mark Myrowich

From: Bill Barnes
Assistant Contract Administrator

Subject: Erosion Control Trial at Springhill

Dear Mark,

I would like to commend you and your innovative Biotic Earth system to help solve one of our major erosion and vegetation challenges on a particularly poor soil area of our project.

The Manitoba Floodway Expansion is one of North America's largest earth moving projects and prides its self on its environmental protection policy. Erosion and sediment control have been a top priority. The area we applied your Biotic System to was a particular challenge since the area is particularly comprised of gravel, sand and heavy clays. This area did not fair well to conventional seeding practices as the soil is considered very poor.

Your approach and innovative solution of Biotic Earth Black along with S32 Erosion Control Blankets has proven to be effective and now that we have tested and proved the system, we will utilize it in other sections of our project in the future.

It is a pleasure to see these innovative and cost effective erosion and sediment control solutions. Your approach and logic has proven effective and I am confident that you will excel with this product line in the future.

Thank you,



VERDYOL

Biotic Earth™ BFM

The Biotic Family:





- 70% Straw with FFF
- 20% Canadian sphagnum peat moss
- 10% Tackifier and growth stimulants

The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





3 Weeks Later

The Biotic Family:





The Biotic Family:





3 Weeks Later



The Biotic Family:





Biotic Earth™ BFM

- Used on slopes up to 1:1
- Where you need effective erosion control and a biotic HGM

The Biotic Family:





To maximize biotic performance

- Conduct a minimum of 3 soil tests to determine
 - Soil pH
 - Fertility requirements
 - Organic content and requirements.

In challenging situations conducting these tests is critical to helping improve your vegetation in the short and long term.

The Biotic Family:





The Biotic Family:





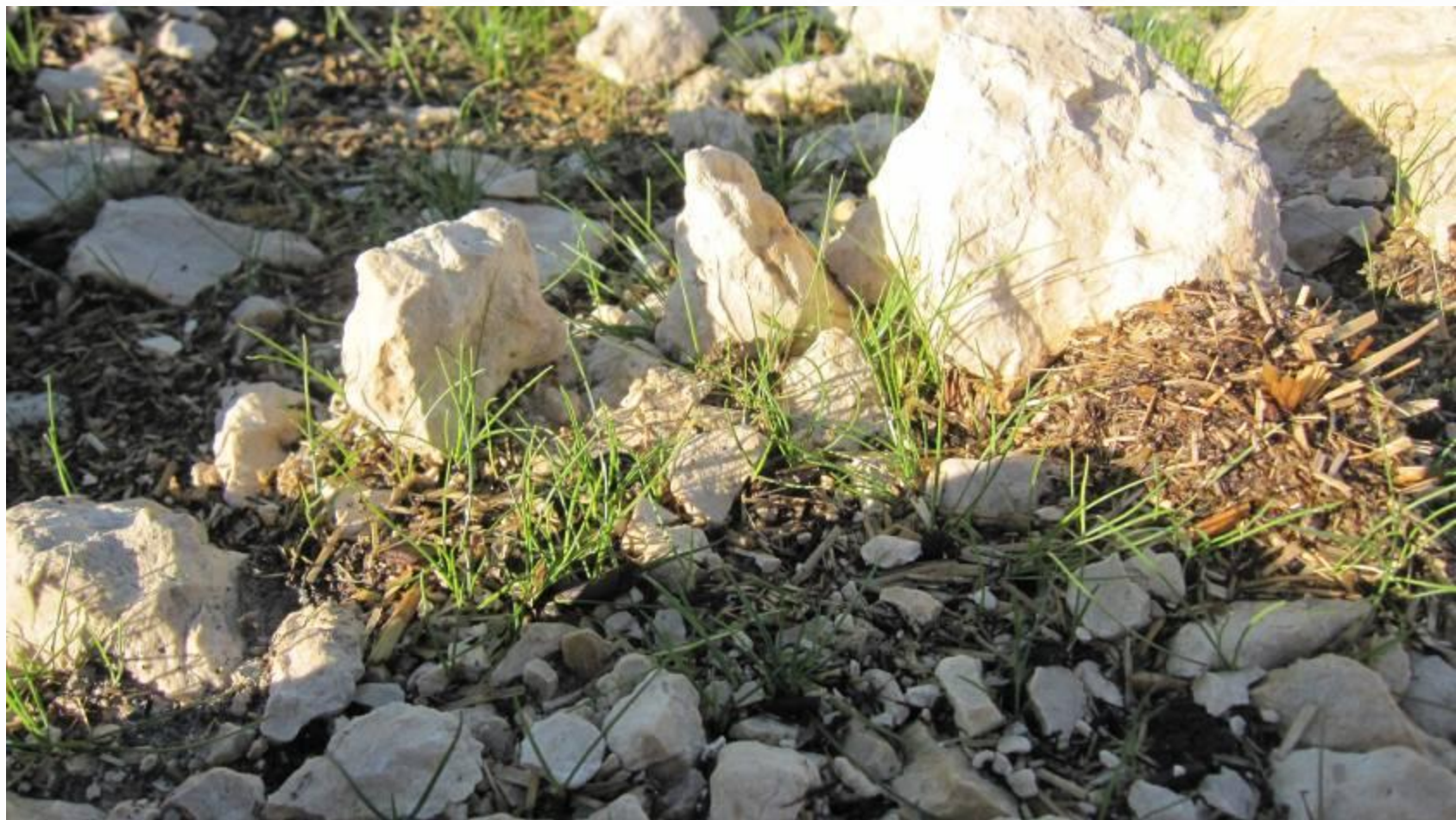
The Biotic Family:





The Biotic Family:





The Biotic Family:





The Biotic Family:





To Maximize Biotic Earth Performance

- Conduct a minimum of 3 soil tests to determine
 - Soil ph (do you need to add lime or Sulfur)
 - Fertility requirements
 - Organic content and requirements

Conducting these tests will help improve your vegetation long term.



Questions

The Biotic Family:

