

Case History

Root Control for Earth Dams

Lima, Montana

William Hawkins, BBA Fiberweb

Private Earth Dam
Lima, MT Cattle Ranch

25 ft. high

350 ft. long

5 Acre Reservoir

Purpose: Create an irrigation reservoir which would double as a habitat for fish & wildlife
(Old reservoir had washed out in the 1930s leaving a wet meadow)

Objective: To create a man made reservoir which would appear to be a natural part of the landscape, with indigenous planting

Problem: Native vegetation known to have invasive roots which could cause dam failure

Project

Build a conventional earth dam and landscape it to appear natural, with:

- Rock outcroppings
- Surface irregularities
- Trees
- Shrubs
- Camouflaged dam mechanics i.e. drains, pipes, gates, etc.

Question: How to prevent root penetration into the structural parts of the dam (core, drainage system, etc.) ?

Possible Solutions

- Large concrete planter boxes
 - Limits the number & location of plantings
- Heavy layer of plaster protecting dam workings and fill
 - Prevents gas and water flow
- Slow release herbicide to redirect root growth
 - New product
 - Has a permeable drainage geotextile as the carrier

Chose the last alternative!

Installation

- Base dam structure completed
- 15,000 sq. ft. of Biobarrier was installed in the down slope (hot melt seams)
- Covered with top soil ranging from 2.5 – 15 ft.
- Installation took 4 people 3 days to complete
- Hydro-mulched with native grasses & wildflowers
- 1300 native trees and shrubs
- Rocks and sod replaced

Results

- The spring after construction
 - Cat tails
 - Bull rushes
 - Arrow arum
 - Waterfowl
- The summer after construction
 - Stocked with trout

Its Only Natural

The dam is protected from root damage
Guaranteed for 15 years
Probably last "Forever"

Earth Dam – Lima, MT 1991

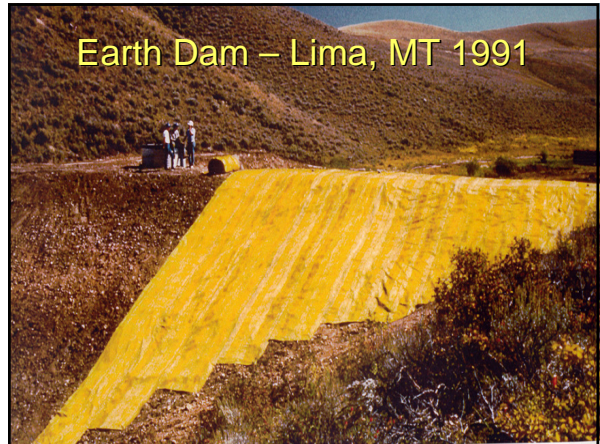


Figure 1: Lima, Montana Birch Creek Dam Project

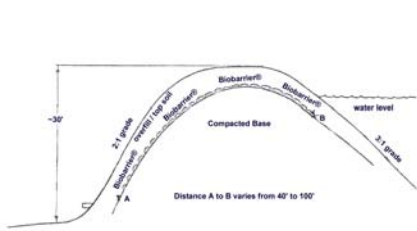
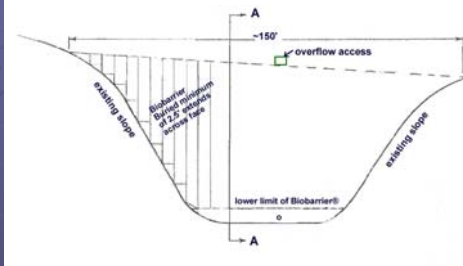


Figure 1 Cont. Lima, Montana Birch Creek Dam Project September 1991



Earth Dam – 12 years later



Basic information about the
technology used

Biobarrier Root Control



What Exactly Is Biobarrier® ?

Biobarrier® Is.....

- ◆ A Long-Term Root Control System
- ◆ Consists of controlled-release nodules impregnated with trifluralin herbicide.
- ◆ Nodules are permanently bonded to 4 oz. Typar® geotextile fabric.

Definition of Controlled-Release Products

- ◆ Release active ingredients at a controlled rate
- ◆ For a sustained period of time
- ◆ In the amounts that are biologically required

DOE Identified Need

- ◆ Prevention of root intrusion into hazardous waste sites.
- ◆ Battelle assigned to do basic research.
- ◆ Major requirement was long-term root control, up to 100 years and beyond.

How Biobarrier® Works!

- ◆ Biobarrier controls roots by establishing a zone that prevents root tip cell division.
- ◆ Trifluralin is not systemic...therefore plants and surrounding vegetation are not harmed.
- ◆ Biobarrier does not disrupt soil hydrology since water and nutrients pass easily through the fabric.

Trifluralin – Active Ingredient in Biobarrier®

- EPA registered
- Non-systemic
- 0.3 ppm. soluble in water...unlikely to leach
- Degrades after release
- Used for 40+ years in agriculture
- Toxicity level between table salt and sugar

Trifluralin Environmental Fate

- Water solubility at 25° C. 0.3 ppm
- Half Life:
 - 9 hours
 - 42 minutes
 - Aqueous Photolysis 41 days (light)
 - Air Photolysis 66 days (dark)
 - Soil Photolysis 1 to 6 months
 - Soil Degradation

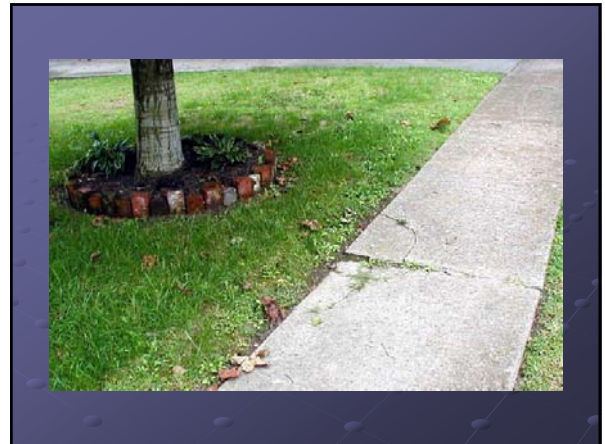
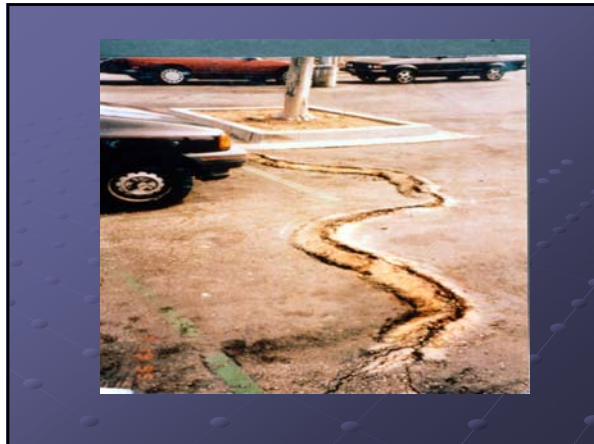
EPA Toxicity Classification

	Oral LD ⁵⁰ (mg/kg.) for rats
I. Extremely Toxic	< 50
II. Highly Toxic	50 – 500
III. Moderately Toxic	500 – 5,000
IV. Practically Non-Toxic	5,000 – 10,000
Examples:	
Nicotine	53
Caffeine	192
Aspirin	1,000
Table Salt	3,000
Trifluralin – Class V	>10,000
Grain Alcohol	14,000
Table Sugar	29,700

Are Tree Roots Really A Problem?

You Decide.....





How Is This Challenge Normally Addressed?



If Not That, Then This.....

- ◆ Mechanical Root Pruning
- ◆ Solid Barriers

Problems With Other Barriers

- ◆ Limited Flexibility
- ◆ Plastic Susceptible to Freeze/Thaw Conditions
- ◆ Impermeable – Can Disrupt Soil Hydrology
- ◆ Physical Barrier Only

Advantages of Biobarrier®

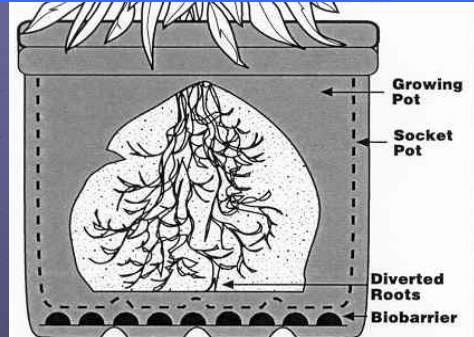
- Longevity
- Permeability
- Easy Installation
- Not harmful to nearby plants and landscapes
- Reduced maintenance costs
- Liability concerns minimized

Biobarrier® Applications

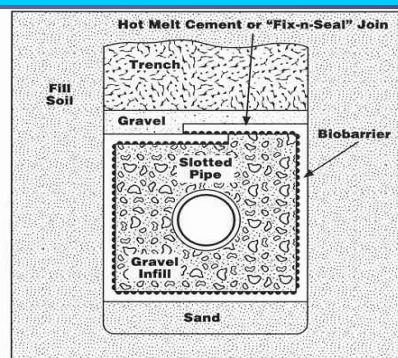
- Sidewalks
- Roads
- Building Foundations
- Curbs
- Swimming Pools
- Tennis Courts
- Septic Tanks
- Golf Course Greens
- Cart paths
- Landscaped Areas
- Vaults/Tombstones
- Drains
- Underground pipes
- Cables
- Landfills



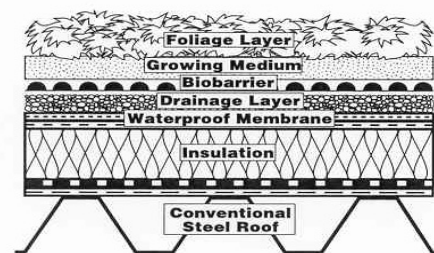
POT 'N POT CONTAINERS

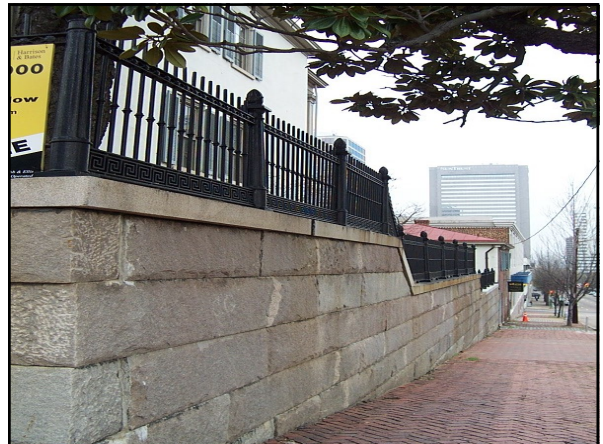
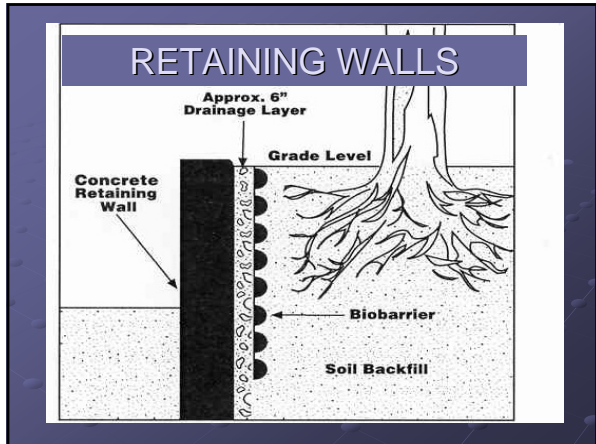


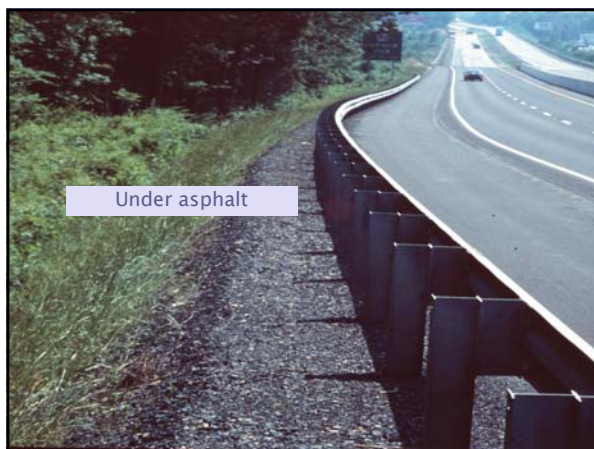
UNDERGROUND TANKS



ROOF GARDENS









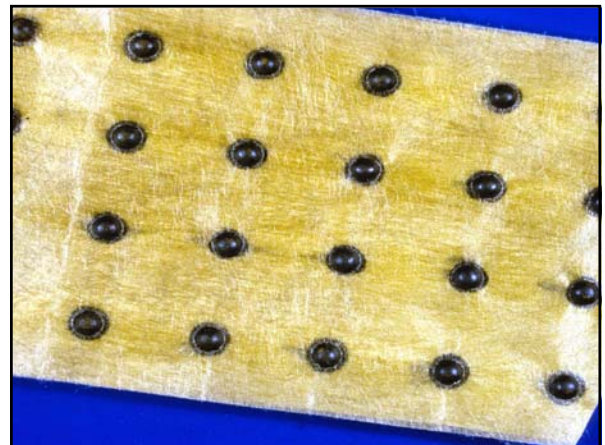
Under Chain Link Fencing



Under Wood Fencing



In Landscaped Beds



Environmental Impact Summary

Trifluralin Herbicide in Biobarrier.....

- is not water soluble
- will not leach
- is classified as practically non-toxic by EPA
- breaks down rapidly
- does not persist in soil
- affects only root tip growth
- has been used for over 40 years

In The Fifteen Years Biobarrier
Has Been On The Market,
No Valid Claim Has Been Made
To This Warranty

Biobarrier® Product Warranty

“Reemay, Inc. dba BBA Fiberweb guarantees no roots will grow through Biobarrier and cause damage to structures for a period of 15 years when used as directed. If damage occurs, we will refund 100% of the purchase price for the Biobarrier in the affected area.”