



TerraZyme®

The Optimal Method of Soil Stabilization

Soil Applications for TerraZyme

- Sub-Base: Improvement Before Paving
- Rural Roads
- Secondary Roads
- Haul Roads: Agriculture, Mining & Forestry
- Airport Runways
- Road Shoulders
- Recreation Paths

TerraZyme Benefits

- Reduces Construction & Maintenance Costs
- Increases Road Life
- Lasting Road Stabilization
- Concentrated - Easy to Mix with Water
- Easy to Apply Using Standard Equipment
- Safe for Workers and Environment

▶ *TerraZyme*® is a natural, non-toxic liquid enzyme formulation that improves the engineering qualities of local soil, facilitates higher soil compaction densities, and increases soil strength and stability for lasting roads.

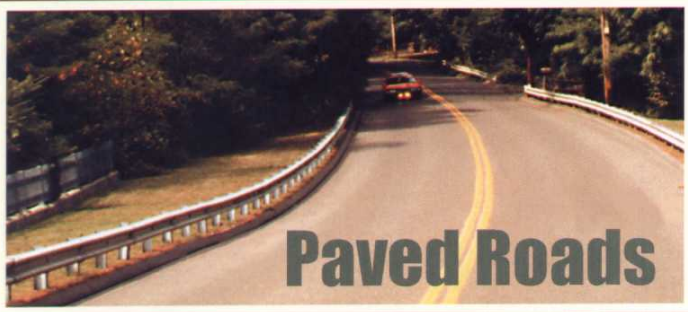
▶ *TerraZyme* is convenient-to-use, safe, effective and dramatically improves road quality, lowers road construction costs and reduces road maintenance.

Reduce Costs of Asphalt & Concrete Roads

TerraZyme can eliminate or minimize the need for hauling expensive materials by improving local on-site soils, while maintaining AASHTO structural numbers needed to ensure road performance throughout the designed life.

Additionally, *TerraZyme* reduces road maintenance costs by strengthening structural layers under pavements. *TerraZyme* increases compaction densities, reduces permeability, and curtails erosion and fines loss from water penetration. It catalyzes strength gains and long-term stability in the road base. Improved road-base strength, stability and resistance to water penetration increase road utility and extend the lives of expensive surface wear layers.

Natural, Safe Technology for Global Road Building

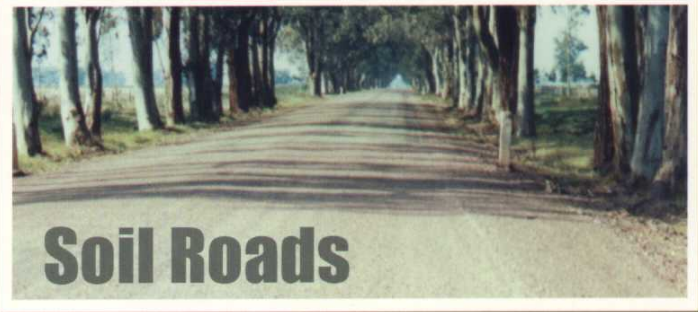


Paved Roads

TerraZyme allows highway departments to extend budgets and upgrade road surfaces.

Road sections stabilized in western Pennsylvania (PADOT 1992) endured sub-freezing winters, over forty freeze-thaw cycles, and required no maintenance for ruts, potholes or washboarding during four years. The stabilized road sections were then given chip-seal coats, and finally asphalt surfaces, without need for further road base improvement. Asphalt surfaces have remained in excellent condition during the past three years without maintenance.

Reducing or eliminating maintenance costs increases return on investment for toll road operators or makes funds available for future road improvements. Lower cost construction alternatives also allow discerning community and national leaders to stretch limited road budgets while increasing the utility and life of public roads.



Soil Roads

A three year study by the Palm Oil Research Institute of Malaysia (PORIM) on soil stabilization determined the following: *TerraZyme* reduced maintenance costs on plantation roads by 75% of the cost of non-treated roads. Roads that needed rebuilding several times per year have remained in excellent condition through four monsoon seasons. Potholes, rutting, washboarding and washouts that damaged haul trucks have been eliminated. Transport speeds and costs have improved while harvest yields have risen from 70% to 100%.

Haul roads in Chilean and Peruvian copper mines support 180-350 ton ore trucks with 25- 30 cm of *TerraZyme* stabilization.

Stabilizing economically important access roads with *TerraZyme* can increase economic potential and convenience for agribusiness, recreation and communities.

National road building and maintenance budgets specify *TerraZyme* stabilization

1 Easy Application

Loosen soil with a Grader or Rotovator



2

Humidify soil using *TerraZyme* mixed with water



3

Mix treated soil to uniformity



4

Compact treated road surface near optimum humidity



TerraZyme Application Requires Standard Equipment

- Tractor or Grader with scarifying teeth
- Tractor with Rotovator or disc
- Water truck with separate water pump
- "Sheepsfoot" compactor/vibrator
- Smooth drum or pneumatic roller (15 - 20 tons)

Technical Support and Road Design Assistance

Initial inspection and analysis of soil and project design are required due to variability of soil, climate and road usage conditions. *TerraZyme* stabilizes soils with a broad range of physical and chemical characteristics. Our engineering staff provides close technical assistance, soil mix evaluations, design/cost analysis, dosage and formulation recommendations; the steps necessary to select the best options for low-cost construction and long life for road projects.

Trained, certified TerraZyme road application teams can average about 7,000 square meters per day.



TerraZyme is a natural, liquid formulation: safe to handle & apply, and safe for the environment.

Full training and support services make *TerraZyme* the Soil Stabilizer of choice wherever it is introduced. Global programs in the USA, Central America, South America, the Far East, and Africa, along with extensive university and government studies, substantiate the benefits and effectiveness of *TerraZyme*. Our experience and collaboration with local engineers yield efficient designs to stabilize local, less costly road construction soils.

Design Roads for High Strength and Low Cost with TerraZyme

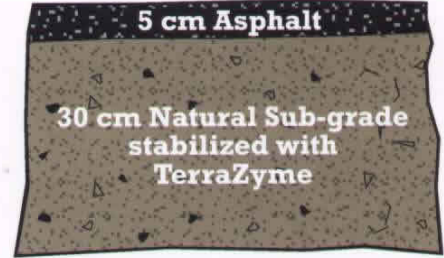
Structure Strength = 100%
Construction Cost = 100%



Structure Strength = 100%
Construction Cost = 80%

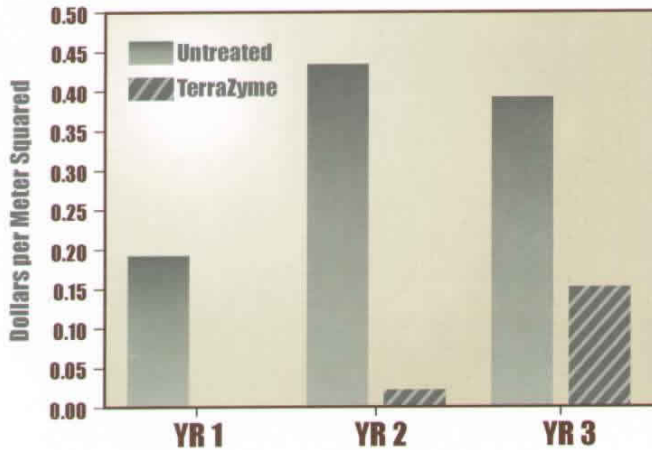


Structure Strength = 100%
Construction Cost = 60%



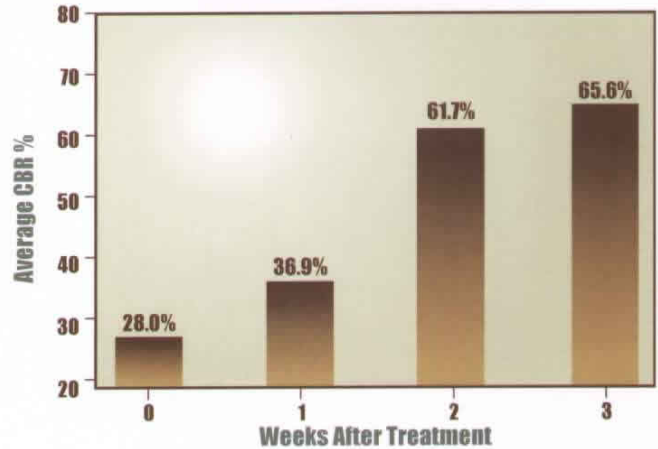
These three road models maintain the same AASHTO (American Association of State Highway and Transportation Officials) structure strength at dramatically different costs. TerraZyme improves low quality local soils and reduces imported materials and construction costs.

Maintenance Cost Reductions Untreated vs. TerraZyme



TerraZyme stabilization of plantation roads reduced road surface maintenance costs by 75% (Study results courtesy of PORIM).

Road Strength Improvements after TerraZyme Stabilization



Lab study results from Brigham Young University, USA, show CBR% strength gains over time in soil stabilized with TerraZyme (actual field CBR% increases exceed these values).

TerraZyme is...

- produced under ISO 9002 Certification
- storeable for up to three years, under reasonable conditions (avoid storage above 65° C [165° F] and in direct sunlight)
- provided in 208 liter (55 US gallon) or convenient 20 liter containers
- concentrated for lower freight cost
- a safe, natural, non-flammable, non-corrosive formulation, fermented from vegetable extracts



For More Information...

on our TerraZyme road testing results, published reports, purchasing product and distributor opportunities, call, fax or e-mail:



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