

## Dust / Sediment Control with Revegetation

### Introduction

Recently, water based polymers have become recognized for use in soil stabilization all over the United States and in many other countries in the world. With an ever-increasing need for environmental responsibility throughout the world, the use of these benign polymers will increase. The real benefit to the applicator or contractor is ease of use, thus less labor costs and product cost / quality comparison relative to the current alternatives.

**DirtGlue™** polymer emulsion is an environmentally friendly, water based, biodegradable, liquid soil stabilizer for soil and seed protection from wind and water erosion. When applied at appropriate rates of application (rates vary depending on performance requirements), **DirtGlue™** forms a three-dimensional matrix in or on the soil that acts as a semi permeable, membrane like structure capable of holding seeds and soil in place, yet, allows water and oxygen to penetrate. **DirtGlue™** can be applied using hydro seeding equipment and other conventional spray equipment, minimizing labor requirements. **DirtGlue™** may also be used to hold mulch or compost on slopes to prevent water erosion and on flat surface to prevent wind erosion.

**DirtGlue™** has been rated as non-hazardous by the EPA, which makes it ideal for all soil stabilization applications in environmentally sensitive areas. Test results indicate that **DirtGlue™**, when used at application rates appropriate for hydro seeding, reduces the water demand of plants in both dry and moist soil conditions.

### The Problem & Solution

Wind and water erosion of the soil is a problem worldwide wherever man or nature has exposed, moved, damaged, washed, or disturbed the soil. Both types of erosion carry away layers of the topsoil necessary to promote vegetation growth. Wind erosion creates dust that is damaging to equipment and is also a respiratory hazard to man and animals. Water erosion creates sediment runoff that damages fragile ecosystems in the wetland areas, streams, rivers, lakes, and estuaries. This then disrupts aquatic life, thereby destroying the food chain. Ultimately enough erosion occurs that seed germination in the soil is nearly impossible. No germination means there are no root systems that would normally stabilize the topsoil and subsoil layers. The result is the surfaces of slopes and embankments are subjected to ever more erosion. Repairing these landslides is a costly and time-consuming procedure involving extensive labor. Prevention is a more efficient and economic solution. **DirtGlue™** offers a long-term (3 -18 months) and cost efficient solution to all dust control and soil stabilization projects. Awareness of environmental concerns and recognizing the importance of labor reduction is a key for business survival in the industry today. **DirtGlue™** is a major contributor in the industry's fight to become more environmentally friendly with less labor costs. **DirtGlue™** will provide a water-borne dispersion that will protect the soil from erosion by wind and water. When used in a revegetation type application, **DirtGlue™** will also protect the seeds from wind and water erosion until they have had time to sprout. In addition, **DirtGlue™** will hold the moisture in the soil and on the seed, as well as help contain a slightly higher soil temperature, allowing for faster seed germination. Tests have shown more than twenty percent (20+ %) increase in overall seed germination with about a thirty percent (30%) decrease in time needed for germination with the use of water-based polymers. In the long-term, **DirtGlue™** is completely biodegradable. There are no toxic side effects on the ecosystem, including plants, aquatic life, or natural soil bacteria. **DirtGlue™** is added directly to the hydro seeding equipment or applied via sprayer after dilution. Other recommended applications

are dust suppression, and mulch & compost stabilization. **DirtGlue™** is an ideal soil stabilizer in quarries, mining operations, sand and gravel pits, golf course construction, commercial and residential developments, and all other types of construction sites where the soil is disturbed and dust or sediment control is necessary.

## **How DirtGlue™ Works**

**DirtGlue™** is a liquid concentrate that when diluted and applied to the soil surface, bonds the individual soil particles together and dries to form a "crust" that strengthens the surface of the soil. It forms a three-dimensional network (depth varies depending on type of application and performance requirements) in the soil, resulting in several beneficial effects. In revegetation applications **DirtGlue™** fixes seed I to the soil grains and promotes germination. In this type of application where the surface is not compacted, rain and oxygen are able to permeate through the "crust." The **DirtGlue™** polymer dispersion holds water in the soil longer and protects the soil and plants from rapid dehydration.

Benefits proven through extensive testing of water-based polymers as growth enhancers include:

- 2-5 days earlier germination
- More than a 20% higher germination rate of grasses
- Higher degree of coverage with water retention in the range of up to 40 %
- Reduction in soil losses due to strong precipitation (sediment control)
- Prevention of loss of fines due to wind erosion (dust control)

## **Sediment and Dust Control**

A field trial conducted at Texas Transportation Institute showed that slope protection with water-based polymer was highly effective under simulated high precipitation. (Example: for a 1:3 slope of loamy soil more than 350 percent greater soil loss was observed on untreated plots compared to polymer treated plots). Field trials completed in France, as well as wind tunnel measurements, indicate a secure protection against soil losses caused by strong winds. Applications of 3-ounces/sq yd (for sand) will resist wind speeds up to 90 mph. Higher application rates (200 gallons/surface acre or 6 1/2 ounces per sq yd) will resist runoff, thereby controlling sediment. Heavy-duty dust control could use up to 300-gallons/surface acre and erosion control/bank stabilization could use up to 600 gallons per surface acre.

## **Why is DirtGlue™ Unique?**

Most other polymer dust control products on the market use vinyl acetate copolymers. DirtGlue Enterprises uses a proprietary polymer additive / mix (with no vinyl acetate copolymers) that is several times more UV stable than the competition and exhibits excellent low temperature application characteristics, as well as having superior flexibility throughout a wide temperature range. The **DirtGlue™** polymer emulsion proprietary product has considerably higher adhesive qualities relative to the copolymers. This gives **DirtGlue™** better bonding capabilities.

**Much of the information in this document was compiled from a report by:**

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Doris Bell, Ph.D., soil ecologist, has been working in the landscaping and reclamation industries for 16 years. Since 1998, she has been working for Cognis Deutschland as a Technical Marketing Specialist. In this role, she is responsible for managing the research and development of Cognis product line for soil and plant protection.

Bettina Kopp-Holtwiesche, Ph.D.

Bettina Kopp-Holtwiesche, Ph.D., microbiologist, has been working on multiple international biotechnology projects for more than 25 years. During the last ten years she was responsible for diverse product and technological developments especially on soil problems and was honored in 1994 with the European invention award.

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