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New Green Technology May Transform Mining and Agriculture Sectors

Juneau, Alaska (January 13, 2012) – Agriculture and Mining companies will be among some of the many industries seeking to benefit from the potential commercial applications of a new green technology. The biopolymer technology may help the Mining industry in its soil restoration and re-vegetation processes, and could significantly increase the growth rates of forage grasses, fruits, and vegetables and other plants for the Agriculture sector.

The Juneau Economic Development Council (JEDC), through its national technology transfer program called SpringBoard, has facilitated cooperative research and development agreements (CRADAs) with various mining and agriculture companies hoping to make use of the biopolymer in their operations. A CRADA is an agreement between a federal laboratory and a non-federal party to perform collaborative research and development in any area that is consistent with the federal laboratory's mission.

The biopolymer technology was developed by federal researchers at the US Army Engineer Research and Development Center's (ERDC) Environmental Laboratory in Vicksburg, Mississippi. This biopolymer is *"a soil amendment developed by studying plants and their root zone bacterial systems and learning how to recreate and enhance that system in laboratory and industrial systems,"* says ERDC Researcher Dr. Steven L. Larson.

The biopolymer's initial application was for soil stabilization in remote areas where helicopter landing pads were needed. Scientists quickly realized it also had a positive effect on germination and growth rates in some plant species. Other positive effects like drought resistance, and fruit and vegetable production increases, are still being researched and discovered.

The biopolymer is made by encouraging bacteria, naturally occurring in root systems of plants, into hyper producing a polymer produced naturally in the root zone of certain plants. The functions of this polymer include surface adhesion, water retention and nutrient accumulation. The end result is a very dense concentration of this natural enzyme that can be used for rapid soil amendment.

The ERDC was honored with the 2011 Sustainability Award in the Green Innovation Category for development of the biopolymer as an alternative to synthetic polymers for soil modification. Partnering with a company called ETS, Inc. (Environmental Technology Solutions), they have been able to commercialize biopolymer production to provide an alternative to petroleum-based polymers for stabilizing and strengthening soil. *"There are other soil stabilization technologies out there, but some are*



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petroleum-based, or otherwise harmful to the environment, so this biopolymer was created as a green alternative,” say inventors Larson and Dr. Kent Newman. The biopolymer is currently licensed to ETS Inc., who produces it commercially.

SpringBoard has set up CRADAs between ERDC and the Ft. Knox and Kensington Mines, both located in Alaska. In mining operations, where land is disturbed in order to access valuable minerals, the mines are typically required to replace the disturbed land and manage the re-growth of vegetation to re-create a viable wildlife habitat. This means planting native plants and trees, and making sure they get established, among other things. The biopolymer has been shown to increase the germination rate and growth and the drought resistance of grasses and nursery seedlings. The mines will test the biopolymer for re-vegetation and aerial seeding, as well as for other potential uses for the mining industry such as soil stabilization and dust control.

In the nursery and landscape agriculture sector, Trees of Corrales, Ltd., a wholesale nursery based in Corrales, New Mexico, plans to test the biopolymer in their propagation department as well as other areas of their growing operation. Another company in the Nursery and Reclamation industry, PhytoLogics LLC, of Montana, who specializes in the remediation of contaminated and salinized sites, is testing the biopolymer on mine sites, areas impacted by saline water, as well as reclamation of oil and coal bed methane (CBM) development sites. In conjunction with specialized amendments, microsite manipulations, planting techniques and materials, researchers at this Montana company are confident that this unique product will enhance reclamation performance on damaged lands.

Further, a milestone CRADA has recently been signed between ERDC, the US Department of Agriculture (USDA) and Smith Seed, a company based out of Oregon, to develop uses for the seed coating industry. This is a unique agreement, since it includes the cooperation of two federal agencies – DoD and USDA. The effort will leverage USDA’s real world agricultural and reclamation expertise, along with Smith Seed’s seed coating expertise, to develop a suitable process for coating seeds with the biopolymer. Ultimately, the result of this effort will be relevant to the seed coating industry as well companies involved in aerial seeding and may prove to have exciting breakthroughs for re-vegetation of challenging terrain. As part of this collaboration, seed will be contributed from USDA; biopolymer will be contributed by ERDC; and the seed coating will be done by Smith Seed. The resulting coated seeds of various species will be tested by the USDA in various locations throughout the United States.

Finally, a recently facilitated relationship between ETS, Inc. and two local high school students in Juneau will be performing a test using the biopolymer for this year’s science fair project. The project will individually test each species of plant used in re-vegetation in Southeast Alaska by the mines to determine which species will or will not respond with increased growth or germination rates from application of the biopolymer. ETS has already delivered the biopolymer product to the students. In addition, ETS has contributed its expertise and some materials to help the research efforts.

As a partner of the US Department of Defense, SpringBoard's purpose is to develop partnerships that result in transfer, commercialization and transition of technologies developed by DoD laboratories and private industry, and support and facilitate K-16 educational programs in science, technology, engineering and mathematics. For more information, visit gospringboard.org or JEDC.org. For all media inquiries, please contact Adrien Lopez at alopez@jedc.org, (907) 523 -2323.



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