

## Forest Concepts Issued US Patent for METHOD OF BALING SWITCHGRASS OR MISCANTHUS AT OPTIMUM HIGHWAY TRANSPORT DENSITIES

January 29, 2012 – Auburn, WA - Today, the U.S. Patent Office issued Patent Number 8,359,974 to Forest Concepts, LLC. This patent provides for compacting switchgrass or miscanthus into rectangular bales, at compression pressures between 4 psi and 32 psi, to achieve optimum highway transport densities, taking into consideration initial moisture content, expected dry-down period, and mode of transportation.

Switchgrass and other tall perennial grasses are expected to become a core element of our nation's strategy to replace imported oil and natural gas with renewable resources, but the large, stiff stems of this biomass type has been problematic to economically harvest using legacy technology.

With USDA support, Forest Concept engineers have elucidated the three rheological properties of switchgrass-like materials – platen pressure v. bale density, Poisson's ratio effect on baling chamber sidewall strength, and coefficient of friction during baling and bale discharge – requisite to predictably and reproducibly bale switchgrass biomass at preselected optimum highway densities while minimizing fossil fuel consumption during baling, handling and transport.



The underlying research was supported by the NIFA Small Business Innovation Research program of the U.S. Department of Agriculture. This patent adds to Forest Concepts' growing portfolio of biomass baling patents. Additional U.S. and international patent applications are pending.

Jim Dooley, co-founder and CTO, said "Understanding the engineerable properties of switchgrass under compression enables economies throughout the biomass supply chain, from field to comminution site – where our recently announced Crumbler™ machinery can efficiently cross-grain shear the stems or billets into precision feedstock particles at field moisture content."

### **About Forest Concepts LLC:**

Established in 1998, Forest Concepts, LLC, a small business located in Auburn, WA, has a mission of developing novel technologies that create high valued uses for the millions of tons of biomass available today. We apply a deep understanding of plant biology, renewable resource production, and disciplined engineering development to create transformational and paradigm-changing solutions. Deployment of Forest Concepts' novel technologies will help reduce dependence on domestic and imported fossil fuels, improve the atmospheric carbon balance, and create sustainable jobs throughout the biomass production and supply industry.

For more information on the company visit our corporate web site [www.forestconcepts.com](http://www.forestconcepts.com)

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