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Edenspace is an award-winning leader in the commercial use of living plants for energy and environmental applications. With 2005 revenues of $1.1 million, the company is nationally known for its technological innovation, excellent client service, and leadership in environmental phytotechnologies. Our goals are to provide the best possible service and value to our clients, to advance environmentally-friendly uses of living plants, and to provide a stimulating and progressive work environment for our talented staff.

Energy Crops

Edenspace seeks to become a key technology supplier to the rapidly growing $9 billion renewable fuels industry by engineering crops with traits that enhance cellulosic ethanol production. Current technology based on fermentation of sugars from starch in corn grain offers limited opportunity to capture the full potential of the surging fuel ethanol market. Since 2003, Edenspace has been engineering crops with genes for increased biomass and expression of enzymes such as cellulases, thereby nearly doubling ethanol yields and reducing the cost of producing ethanol from cellulosic biomass. Cellulases are biodegradable enzymes that break down cellulose – which like the starch in corn grain consists of a long chain of sugar molecules – into simpler sugars that can be fermented into ethanol. External cellulases manufactured in bioreactors today represent up to 30% of the cost of cellulosic ethanol. High-efficiency energy crops are projected to reduce the cost of a major renewable fuel by 20%. Other benefits include reduced emission of CO_2 from fossil fuels, increased energy independence, and increased farm income.

Edenspace's market strategy is to develop a technology platform for engineering corn, switchgrass and other crops as cellulosic feedstocks to address the rapidly-growing worldwide fuel ethanol market. Enhanced corn varieties will integrate use of corn stover into existing corn grain ethanol production facilities, introducing an improved product into an existing customer base. Eventually switchgrass is expected to reduce the use of corn for ethanol production because it can be grown at lower cost and with less environmental impact. Key elements to market success are superior crop performance, integration with current ethanol production processes, and regulatory approval of engineered crops for production of low-cost renewable fuel.

Figure 1. Three varieties of switchgrass (Photo courtesy of Oak Ridge National Laboratory).

The company has signed cooperative research agreements (CRADAs) and IP licenses with NREL and USDA, and sponsors development work at Michigan State University. Near-term milestones include establishing a strategic partnership with a leading ethanol producer; successfully completing a 2006 field test; hiring additional development personnel; and completing a Series A funding round.

Environmental Phytotechnologies

With more than two dozen field projects completed or underway, Edenspace is a commercial leader in the use of plants as solar-powered sensors, covers, pumps and filters. This exciting new approach, called phytoremediation, literally grows a clean environment, offering substantially lower treatment costs as well as important environmental and aesthetic benefits. The company acquired Phytotech, Inc., a pioneer in metal phytoextraction, in 1999.

Current projects include removing soil arsenic from industrial, government, and residential sites; removing lead from residential properties; and developing transgenic plants for low-cost production of ethanol and as biosensors that change color in the presence of environmental contaminants. Low cost, scalability, and greater convenience are the major advantages of these techniques relative to competing technologies. Over time, the ability to recycle lead and other metals recovered by the plants will become attractive to customers facing regulatory and legal pressures in conjunction with soil disposal. Other than in Japan, where it is represented by Fujita Corporation, Edenspace directly markets its products and services to site owners and environmental consultants.

Edenspace sells plants that reduce levels of soil arsenic deposited by CCA pressure-treated lumber, pesticides, herbicides, and industrial activity. The company also sells proprietary, biodegradable amendments that enable turf grass to reduce levels of soil lead in the six million American yards that exceed USEPA guidelines. Edenspace is developing transgenic plant-based biosensors for use with landfills, mines and farm properties. More than half of the company's customers are government agencies, including the U.S. Army Corps of Engineers, U.S. Army TACOM-ARDEC, U.S. Departments of Agriculture, Energy, and Housing and Urban Development; and U.S. Environmental Protection Agency. Other customers include U.S. and foreign companies, academic institutions, and individuals. Edenspace received the DaimlerChrysler Environmental Excellence Award in 1999 and the Environmental Business Journal Technology Award in 2004.

Patents

Edenspace owns, or has exclusive license to, seventeen patents and two patent applications relating to plant biosensing, phytoextraction, hyperaccumulation, and rhizofiltration. The substantial investment in proprietary technology reflected in its patents and licenses reflects Edenspace's commitment to provide its customers with top-quality service based on cutting-edge research.

Discuss Your Needs

Should you be interested in the applicability of environmental phytotechnologies to a particular project or site, please contact us by e-mail at info@edenspace.com, or by telephone, fax, or mail at the address below.

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