

STARTUP CITY

AG TECH STARTUPS EDITION

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15 MOST PROMISING AGTECH STARTUPS - 2019

The scope of AgTech advancements over the past couple of years is nothing short of astonishing. Today's growers are equipped with extensive science-based tools, spanning from disease-resistant seeds, precise nutrients, biological crop inputs, data-driven farm management to robotics for boosting on-farm productivity and reducing food waste. In comparison to other sectors, including renewable energy and cleantech, food and agriculture stands out due to its compelling long-term fundamentals, driven by rapidly changing dietary trends and population growth, along with a sharp focus on resource constraints and sustainability. Stakeholders in the agriculture industry, be it farmers or food producers, are realizing the value of embracing digital transformation as a sustainable and scalable way to take agriculture to new heights, all the way from farm to fork.

While IoT is streamlining the aggregation, inspection, and overall distribution of agricultural resources using sensors on equipment and materials, drones are being readily deployed to monitor crops and prepare for drought and other harmful environmental factors. Much like in other major industries, robotics and artificial intelligence are drastically improving productivity and generating higher and faster yields in agriculture. Additionally, RFID sensors are facilitating hassle-free tracking of food from the field to the store, increasing trustworthiness for manufacturers and their responsibility to provide fresh produce and goods along with machine learning predicting the traits and genes that best enhance crop production.

From providing diverse technologies and unparalleled knowledge on indoor farming to leveraging advanced LED lights to improve productivity, organizations are tapping onto new avenues created by digital technology. With several innovative technological capabilities and success stories up their sleeves, these startups are constantly proving their mettle in the field of agriculture. We hope this issue of the StartupCity helps you build the partnership you and your firm needs for fostering a technologically-driven agricultural environment.

We present to you StartupCity's "15 Most Promising AgTech Startups 2019."



COMPANY:
NewLeaf
Symbiotics

DESCRIPTION:
UTILIZING M-TROPHS, NEWLEAF SYMBIOTICS HELPS FARMERS INCREASE YIELD, FROM PLANTING THROUGH HARVEST

KEY PERSON:
THOMAS LAURITA
PRESIDENT, AND CEO

WEBSITE:
NEWLEAFSYM.COM

NewLeaf Symbiotics

At the Forefront of Plant Microbiome Innovation

Amid the growing dangers of climate change, there is an increasing demand for high-quality agricultural products and a transparent food system. Farmers are hard-pressed to overcome age-old challenges like pests, disease, and drought using conventional methods and traditional chemistries. Converting more land for agricultural purposes is no longer an option because of growing urbanization, pollution, water shortages, and soil degradation that have already reduced worldwide arable land. These challenges can only be solved by increasing the productivity of the existing cultivable area using sustainable methods and innovative agricultural technologies.



Thomas Laurita,
President, and CEO

Because the plant microbiome is central to plant health and growth, agricultural biologicals hold the promise to improve crop yield sustainably. Seeds treated with biologicals experience many benefits, including enhanced nutrient uptake, improved yield, and disease resistance. However, there exist millions of microbial strains that can potentially help plants thrive. Some companies try to address extreme microbiome diversity by screening microbes in controlled environments like greenhouses, and others conduct direct field trials to measure yield from a broad swath of microbes applied to key crops. St. Louis-based NewLeaf Symbiotics pursues a unique strategy by focusing solely on the naturally occurring microbes known as pink pigmented facultative methylotrophs (PPFMs) or M-trophs. The company envisions creating a new class of safe, sustainable,

and effective agricultural inputs that empower farmers to improve crop health and yield. “We believe M-trophs have the potential to revolutionize the legacy approach to agriculture,” states Thomas Laurita, president and CEO of NewLeaf.



As leaders in plant microbiome technology, NewLeaf will realize the full potential of M-trophs and enable the transformation of agriculture to a more sustainable future



UNLOCKING THE POWER OF M-TROPHS

M-trophs are bio-complements that function in harmony with existing chemical and seed technologies and agricultural practices. Making up a large portion of the total population in the plant microbiome, M-trophs enhance nutrient utilization efficiency, secrete essential natural plant growth hormones, and induce systemic resistance to ward off pests. M-trophs promote seed germination and overall plant growth. “At NewLeaf, we are tapping into the seemingly endless potential of these beneficial microbes that constitute over 50 different species and millions of strains,” adds Laurita.

Since its inception, NewLeaf chose to develop deep knowledge of the plant enhancing characteristics inherent in M-trophs to build its product portfolio. The company created and developed a bioinformatics computational engine called the Prescriptive Biologics Knowledgebase® to predictively associate microbial genotypes to beneficial crop phenotypes.



NewLeaf has fully sequenced the genomes of a large portion of M-trophs in its 12,000 strain library, and the company has concentrated on producing these microbes at a large scale economically as they need to be used over millions of acres.

NEW CLASS OF AGRICULTURAL BIOLOGICALS

In 2018, NewLeaf launched several agricultural inputs under the brand name Terrasym®. These products contain specially selected living M-trophs suited to specific attributes and growing conditions and can be applied in-furrow, on seed, or as foliar sprays. Terrasym products establish a natural, permanent partnership with plants and this symbiotic relationship makes crops stronger, more stable, and tolerant of stress throughout their life cycle. NewLeaf has introduced two seed treatment products for soybean and one for peanut, and in 2019 launched a corn in-furrow product that increases yield by more than 8 bushels/acre. Currently, Terrasym is only available in the U.S market, but there are plans for release outside the country in the near future. With a belief that M-trophs will be eventually applicable all over the world, NewLeaf intends to cover a wider variety of crops with its product line.

In 2019, the Midwest experienced record rainfall, causing the soil to be too wet for planting seeds. As a result most crops were planted a month late and in many locations no crops were planted at all. In such a scenario, growing crops, especially

soybeans, presented several challenges. Treating soybeans with Terrasym 401 helped the farmers in the region stimulate the growth of the soybean plants. 2018 field trials at 35 locations across the Midwest, including Nebraska, Missouri, Iowa, and South Dakota, demonstrated an increase in yield by 2.7 bushels per acre compared to previous years.

A CULTURE OF COLLABORATION

Founded in 2013, NewLeaf boasts a team consisting of a broad spectrum of ages, depth of experience, and various industry backgrounds ranging from agriculture to computational data science. It has a very collaborative environment initiated by its founders and carried on by its leadership. Each person in the company possesses a belief that agriculture is essential to the world and that there is a lack of innovative solutions to feed the growing population. This culture has carried on from its early days when the company relied on external resources like the Donald Danforth Plant Science Center for lab space and greenhouses.

With the looming threat of overpopulation, innovative agricultural technology is vital to improve crop yields and solve the world's growing food shortage demands. "As leaders in plant microbiome technology, NewLeaf will realize the full potential of M-trophs and enable the transformation of agriculture to a more sustainable future," ends Laurita. 🌱