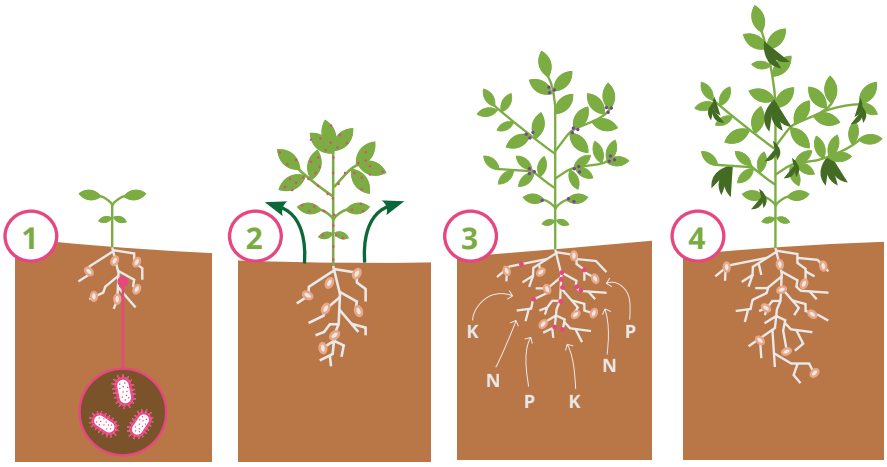
terrasym®

A MICROBIAL PLATFORM DESIGNED TO FIT THE NEEDS OF GROWERS LOOKING TO INCREASE YIELD, PRODUCTIVITY AND OPERATIONAL SUSTAINABILITY.

The Terrasym® platform offers growers a better, more cost-effective method to increase crop productivity, resulting in robust plant growth, enhanced nutrient uptake, increased yield potential and improved crop quality. This easy-to-use platform helps growers optimize in-season performance through increased efficacy of current inputs and is complementary to traditional practices.

HOW IT WORKS

1. Terrasym products contain specially selected beneficial microbes called methylobacterium or *pink pigmented facultative methylotrophs* (M-trophs). M-trophs establish a natural, permanent partnership with plants. This symbiotic relationship facilitates improved plant development and nutrient uptake, ultimately making crops stronger, more stable and more tolerant of abiotic stress, from germination and emergence through harvest.
2. As broad plant colonizers, M-trophs spread rapidly from the seed surface across a plant's roots and leaves. They support stand establishment by promoting consistent emergence and larger root systems.
3. M-trophs improve nutrient uptake by populating plant roots and promoting higher numbers of root tips and root nodules, which in turn enhance nutrient acquisition. They also secrete beneficial molecules into the root zone that can bind and transport yield-enabling micronutrients.
4. By consuming methanol – a by-product of plant metabolism – M-trophs colonize at zero energy cost to the plant. This leaves more energy available to the plant for nutrient uptake, resulting in increased chlorophyll content and enhanced photosynthetic efficiency, both of which translate to increases in yield.



PRODUCT BENEFITS

DEVELOPED TO IMPROVE YIELD

Proven to increase corn yield by 5.9 Bu/A and soybean yield by 3.8 Bu/A over a comparable check.*

ENHANCED NUTRIENT UPTAKE

Increased uptake of nutrients like iron and manganese in corn, and iron in soybeans.

STRENGTHENED CROPS

Infuses plants with microbes to help improve nutrient uptake, making crops stronger, more stable and tolerant of stress.

BROAD COMPATIBILITY

May be used as a standalone technology and combined with other crop inputs. Seed treatment application method for both soybean and corn.

FIELD TESTED FOR 5+ YEARS

Over 600 trials have been conducted in 42 unique locations, spanning 19 states with independent researchers, including 7 universities.

*All treatments had base fungicide and insecticide

NewLeaf symbiotics®

DIGITAL IMAGING OF ROOT TRAITS (DIRT)

QUANTIFYING TERRASYM PRODUCT CLAIMS THROUGH IN-DEPTH ROOT SYSTEM CHARACTERIZATION.

In 2020, NewLeaf Symbiotics partnered with independent data company IN10T® and their expansive FarmerTrials Network to bring commercial-scale data and insights on the agronomic benefits of the Terrasym product line.

As an extension of these trials, NewLeaf scientists are also using DIRT (Digital Imaging of Root Traits) software for root characterization to further quantify Terrasym product claims in a way that's never been done before. It's one thing to claim, "enhanced root development." It's something else entirely to be able to track data points that support the claim.

DIRT PROCESS

At each FarmerTrials location, 10 plants are chosen at random from each treatment by IN10T field technicians. They are dug up, rinsed of soil and photographed on a black background with a size marker (a poker chip) to be processed using DIRT software.

Once the images are uploaded to DIRT, the software identifies all pixels associated with roots, creating a flat black and white mask to calculate root system architecture traits as well as a detailed root "map" to identify branching points and root tips. In total, DIRT returns 75 unique root system architecture measurements.

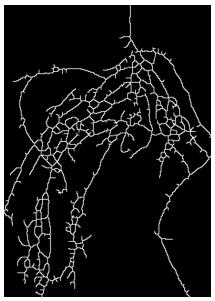
DIRT TEST IMAGE EXAMPLE

IN10T PHOTO LAB SPECIMEN

Size marker (poker chip) used to convert pixels to length & area.

DIRT OUTPUT: TOTAL PIXELS

Used to calculate area.



DIRT OUTPUT: ROOT PATH MAP

Used to calculate number of tips, paths, crossings, etc.

	Corn	Soy
TOTAL ROOT AREA	+4.3%	+12.3%
SKELETON ROOTING DEPTH	+2.4%	+12.8%
SKELETON ROOTING WIDTH	+5.1%	+10.4%
NODAL ROOT LENGTH*	+9%	Metric not applicable to soy
NUMBER OF ROOT TIPS	Metric only available for soy	+5/9%

*Nodal roots traced and measured in image.

Corn DIRT Results Source: Showcasing Percent Increase Compared to Control; 2020 IN10T FarmerTrials; All untreated checks and M-troph treatments have base fungicide and insecticide application; Sample size, n = 10 plant per treatment per location; Trends reported for Terrasym 450 combined with in-furrow application (in-furrow application: V2-V4, 22/24 locations reporting; seed treatment application: V2-V4, 5/6 locations reporting).

Soy DIRT Results Source: Showcasing Percent Increase Compared to Control; 2020 IN10T FarmerTrials; All untreated checks and M-troph treatments have base fungicide and insecticide application; Sample size, n = 10 plant per treatment per location; Trends reported for Terrasym 401 (16/18 locations reporting), NL 12 (10/12 locations reporting), NL 13 (16/18 locations reporting).

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