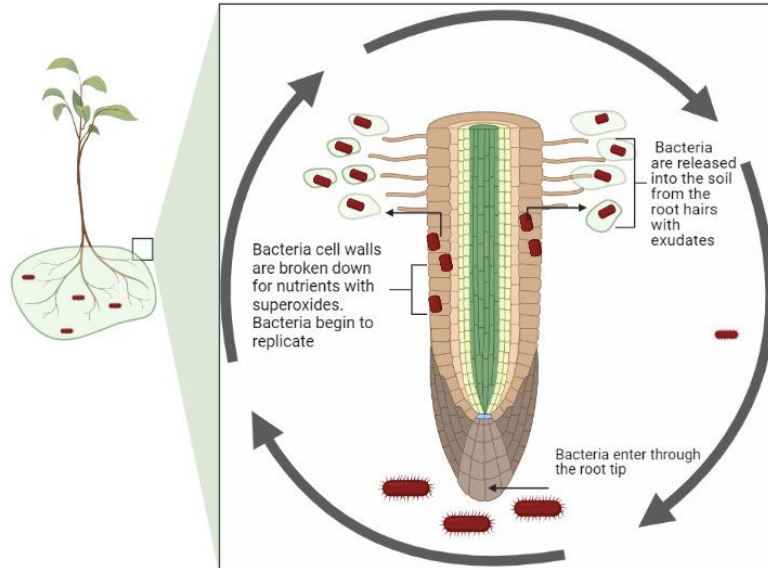
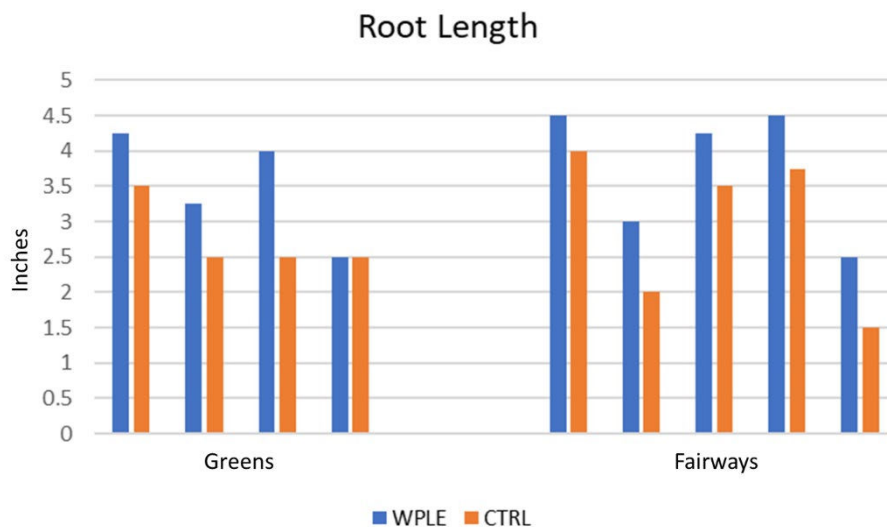


Research shows that plants cultivate microbes in the soil. Plant roots attract microbes with exudates, then absorb microbes into the growing root. The root produces superoxides to extract nutrients from the microbes. The microbes then give off nitrogen and ethylene, which promote root and plant growth. The microbes replicate inside the root. The root then forms root hairs to return microbes to the soil. The microbes receive plant exudates to help them reacquire nutrients from the soil, and then the process begins again.

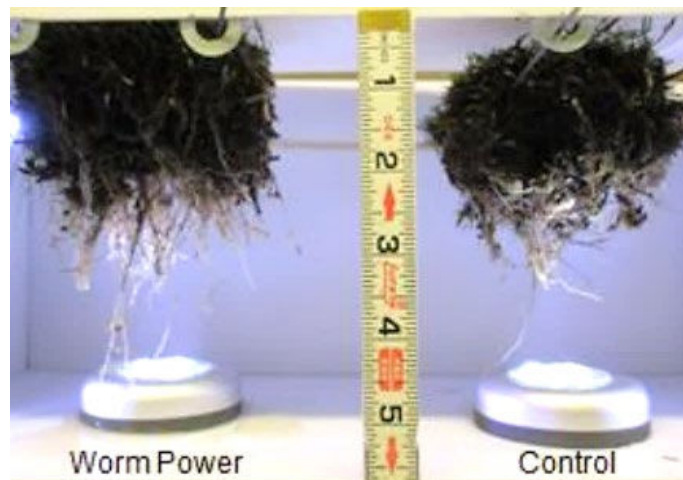
This process is the rhizophagy cycle and proves that the presence of microbes supports root growth, root hair formation, and root development in the soil. Without microbes, roots would not form root hairs and would decrease root branching. Microbes are essential for root development, nutrient uptake, and plant health.



Worm Power Liquid Extract (WPLE) has 1,400 different microbes in suspension that provides the roots a diverse population for obtaining nutrients. The recommended application rates for turf are 8 oz / 1000 ft² bi-weekly or 16 oz / 1000 ft² monthly.



Root plug comparisons (above) of WPLE treatments to an untreated control (CTRL) were taken across multiple golf courses in the United States. On average, a bi-weekly 8 oz application increased root length **27.9%** on greens and **34.1%** on fairways.



Root comparison (above) of bermudagrass fairway control and 8 bi-weekly applications of 8 oz of WPLE.

One issue for turf grass is managing thatch build up. Thatch is a mixed layer of living and dead shoots, stems, and roots below the actively growing grass and soil surface. While a thin layer of thatch can be beneficial for turf resiliency and soil moisture, thatch layers greater than ½ inch can negatively impact turf. This buildup of organic matter can affect the movement of water, nutrients, and air to the roots. These poor growing conditions can cause issues from losing soil moisture, crown injury, holding excessive water, or harboring plant diseases.

Thatch build up occurs when turf grass produces organic debris faster than the debris can be broken down. One of the issues that allows thatch build up is poor soil conditions that do not sustain microbes that can aid in organic matter decomposition. Treatments of pesticides and fertilizers are important for management but can alter the soil acidity and inhibit the beneficial microorganisms in the soil.



A fall trial (above) evaluated 16 oz of WPLE monthly to an area of fairway for thatch reduction. Eight days after application, differences in thatch were observed and noted 16 oz monthly was effective for thatch reduction.

Microbial populations in the soil are important for managing the build up of organic matter as part of a sustainable solution in turf grass. Trials have shown that Worm Power Liquid Extract can increase root length and reduce thatching in turf grass. Better root systems allow for enhanced water usage and provide plants with a healthier foundation.