



EARTHGEN215, LLC

July 2026 Newsletter

A GLIMPSE AT WHAT IS GOING ON UNDER YOUR FEET!!

Most states west of the Missouri River are enduring intense droughts and various temperature extremes. Many areas in the Midwest and Southern states are as well. Some areas are experiencing dramatic weather conditions that include flooding and erratic temperature extremes.

Spore-forming bacteria such as *Bacillus* species and actinomycetes have effective means for surviving drought. Applying the products EarthGen215 distributes trigger more rapid reproduction of these bacteria and actinomycetes in soil.

Bacillus species form resilient, dormant endospores that survive years of desiccation, which can be caused by drought conditions. These spores awaken when moisture returns. The amount of moisture necessary to wake up such endospores is like the amount of moisture necessary to germinate seeds.

Bacillus bacteria improve the availability of essential soil nutrients to plants' roots, which facilitates better growth and crop production. They also help suppress plant pathogens, reducing incidences of diseases that can compromise crop health, quality, and yields. Beneficial spore-forming bacteria improve soil structure which enhances plants' resilience when challenged by any type of weather-related stress such as extreme temperatures, drought, excess moisture from flooding, or increases in soil salinity.

Actinomycetes also form spores and can also go into a dormant, low-metabolism state. An example of actinomycetes is *Streptomyces*, which is the organism that causes the smell of healthy soil after a moistening rain. Actinomycetes accelerate decomposition of crop residue and form soil aggregates. Both of these functions make nutrients otherwise trapped in that residue more available to growing crops. Actinomycetes also produce antimicrobial materials that protect plants and their roots from diseases and various pests. Actinomycetes are among the beneficial bacteria bolstered by applications (as recommended) of the products EarthGen215 distributes.



Colonies of Actinomycetes

Both arbuscular mycorrhizae and ectomycorrhizae are very drought resilient. Mycorrhizae form extensive hyphal networks that access water from soil pores too small for plant roots to access, and they can actually increase in relative abundance during periods of drought since they are more drought resistant than are bacteria that are not spore-forming. One characteristic of fungi that makes them



Mycorrhizal fungi, microscope-enhanced

more drought resistant than non-spore-forming bacteria is the fungi's thick chitin cell walls. Many fungi also form thick-walled spores that can remain dormant for long periods and can endure a variety of harsh conditions. Arbuscular mycorrhizal fungal spores are one of the most drought-tolerant spores in soil. Mycorrhizal fungi produce sticky material that promotes development of soil aggregates. Mycorrhizal fungi form symbiotic relationships with all plant roots, extending plant roots' access to nutrients and moisture that otherwise are beyond the reach of the plants' own root systems. It is especially known for enhancing the uptake and assimilation of phosphorus from soil. Mycorrhizal fungi development is also boosted by applications of the products EarthGen215 distributes.

Tardigrades are another example of organisms enhanced by applying the products EarthGen215 distributes. **Tardigrades are truly remarkable. They survive extreme conditions of every dimension, including extreme temperatures, crushing pressure, and dehydration.** When conditions become harsh, tardigrades curl into a dehydrated state called a "tun." When in tuns, tardigrades drop their metabolism to nearly zero, and they can remain viable in such a state for decades. **REMARKABLE.** They rehydrate when moisture is adequate and return to thriving, working in the soil, and reproducing themselves.



Tardigrades 10,000x

Beneficial nematodes also enter a dormant state called anhydrobiosis. When in this state, beneficial nematodes basically suspend their metabolism until adequate moisture returns.

Earthworms are well-known for improving soil structure by decomposing dead matter in soil, transforming it into tilth, soil aggregates that hold soil moisture effectively and efficiently. Earthworms' burrowing creates channels in soil that facilitate infiltration of moisture and oxygen essential for nutrient-uptake by crops' roots. Healthier soil structure helps soil rebound more vigorously from

adverse weather events. During droughts, earthworms often burrow deeper into moister soil layers. Some species of earthworms form protective cocoons or otherwise go dormant until moisture conditions improve. Generally, earthworms and beneficial nematodes are more plentiful where the products EarthGen215 distributes are routinely applied, as recommended.

Consistent practices that build soil organic matter maintain soil structure that can withstand weather-related challenges such as erratic temperature extremes and drought. Practices that build soil organic matter include keeping soil surfaces covered with production crops and cover crops. Bare soil heats up faster and loses moisture much more quickly than soil that is covered. Beneficial soil organisms thrive in soil that is not bare. Minimizing tillage and other equipment traffic also contributes to building and maintaining healthy levels of soil organic matter. Too much equipment traffic on soil can contribute to soil drying out more quickly. Equipment traffic can also cause more soil compaction which reduces pore space in the soil, diminishing the capacities of beneficial soil organisms to do their essential work. Compaction also limits water and oxygen infiltration in soil. Overuse of synthetic fertilizer, especially during periods stressful to soil and crops, can push plants and beneficial soil organisms into less resilient growth patterns. Synthetic fertilizers do not replace the readily available nutrients and enzymes in soil organic matter, nor do synthetic fertilizers have the water-holding abilities that soil organic matter provides. As much as possible, avoid applying fungicides. Fungicides non-selectively kill all organisms, including beneficial organisms in soil. Applying the products EarthGen215 distributes ECS compliment practices that build healthy organic matter levels in soil. Now is a great time to start planning for 2027 production, by designing 2027 plans that will best incorporate practices that build and maintain soil organic matter. EarthGen215 looks forward to being part of each of those plans for 2027.

Please keep in mind that prices have DROPPED (boy, you don't hear that much lately!!) so please take advantage of it for your Fall application!!

I am here to help and look forward to speaking with you!

PS Please enjoy the new website!!!

Tom

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