February 2025 Newsletter

# WORMS, THE HEAVY EQUIPMENT OPERATORS OF THE SOIL!!!

Soil temperatures are warming and soon many beneficial soil organisms will emerge from their winter dormancy. Many microorganisms and earthworms become active once soil temperatures reach about 40 degrees, Fahrenheit. Applying the products as recommended boosts reproduction and other activities of beneficial bacteria and beneficial fungi. These activities can warm cold spring soils by about 5° to 6° F. Earthworms tend to thrive in soils with higher beneficial bacteria. Earthworms and beneficial bacteria each rely on the other's activities to help decompose organic matter.

Decomposed organic matter provides nutrients for both earthworms and the beneficial bacteria. The presence of beneficial microorganisms and earthworms creates a symbiotic cycle for soil health. Of course, activities of various arthropods also factor in the building of healthy soil structure and humus. This Newsletter focuses most on the essential roles of earthworms in soil. Soil inhabited by earthworms is nicely granulated and friable. It is easier to cultivate, and it absorbs water effectively. Such soil also allows water to disperse more evenly throughout the soil in a field. Soil without earthworm inhabitants tends to be compacted, or more easily compacted. It does not absorb water efficiently, and it does not allow water to transfer evenly throughout the field. Soil management practices invite or discourage the existence and proliferation of earthworms in soil. Producers of organic crops, those producers who use no chemical fertilizers, as well as no herbicides, pesticides, nor any fungicides, are most likely to have soil brimming with earthworms. Applying the products EarthGen215 represents in organic food

production often fosters production of more humus by earthworms and by decomposer bacteria. These benefits and functions combine to infuse soil with healthier levels of oxygen. Producers who apply minimal levels of commercial nitrogen fertilizers and minimal herbicides in combination with ECS Biological Products as recommended, also see increases in earthworm populations in their soil, and corresponding improvements in humus and oxygen levels in their soil. Applying composted manure, rotating crops, and in some situations, applying mined gypsum or mined lime compliments the work of earthworms and the functions of these Biological Products. Please feel free to contact EarthGen215.com to discuss application protocols that include applying these products.

Earthworms are invertebrate animals, each with a brain, a mouth, and five pairs of heart-like structures called aortic arches. These aortic arches pump oxygenated blood throughout the earthworm's body. Each earthworm also has a crop (a vital part of the earthworm's anatomy that is a temporary storage chamber where food is held before it moves onto the gizzard for further breakdown), a gizzard, and intestines. Earthworms living in soil breathe through their skin, and many earthworms living in wetter environments have gills through which they breathe.

The anatomy of each earthworm is more complex and intricate than this brief description. This description is provided as context for the miraculous work accomplished by earthworms. Earthworms eat remains from dead plants, animals, and other soil organisms, along with some soil and small rocks. All this consumed matter is transformed within the bodies of earthworms into humus. Humus is nutrient-dense topsoil that absorbs water efficiently. Each one percent of the humus holds nearly one-half inch of water per acre. Humus also holds a wealth of water-soluble nutrients in the proportions most likely to promote optimum growth and production. Although eliminations from earthworms are humus, they are often called "castings." Castings from earthworms in soil with a pH lower than 6.6 (acidic soil), are less acidic than the soil from which they are derived. Likewise, earthworm castings emitted by worms in alkaline soil (soil pH above 6.9) are less alkaline than the soil in which those earthworms live and work. In essence, earthworm castings help neutralize soil pH, bringing soil pH into the ideal range of 6.6 to 6.9, or at least bringing it towards that pH range. The top picture to the right shows a pile of earthworm castings in some of Utah's red soil. These castings received significant rain shortly before this picture was taken. They absorbed the rain and still held their crumbly structure. The lower picture above displays earthworm castings mounded among tufts

of alfalfa growing in a Wyoming hay field. Again, earthworm castings contain water-soluble nutrients, which makes those nutrients immediately available to growing crops. Increased humus, easily accessible nutrients, healthier oxygen levels, and more consistent supply of water, all combine to make soil structure healthier, and the soil more productive. This correlation between healthier soil and improved production produces crops that tend to be more resistant to infestations by pests, diseases, or both. Interestingly, fruit trees produce more abundantly when soil holding their roots is filled with earthworm castings. The product  line EarthGen215 represents work synergistically with earthworms.

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I hope you found this information helpful and informative. We look forward to helping you INCREASE YOUR YIELDS AND DECREASE YOUR COSTS!! We carry time tested (30 years) liquid and dry biological products. You can find us at EarthGen215.com.

Talk to you soon!!!

Tom

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Managing Member

EarthGen215.com

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