



March 2025 Newsletter!!

Essential Seed Germination and Seedlings' Early Growth

How do seeds manage to germinate in the right place at the right time, (most of the time)? The concise



Rye grass being raised in a greenhouse in March, for its abilities to scavenge nitrogen from the soil and hold it.

answer to that question is that God creates seeds to contain all the DNA, nutrients, enzymes, hormones, and other matter essential to germinate. Then a radicle sprouts, and it develops into the primary root. Eventually a shoot pushes through the soil surface. All these activities occur when and as the seed, its root, then its shoot has the optimum chance of surviving. Producers have no control over weather related factors, but they can be aware of seasonal patterns, and watch local weather forecasts when making planting plans, and other production related plans. Examples of what a producer can

control include the following: 1) seed selections; 2) timing for planting; 3) seed-density planted; 4) crop/production rotations or companion cropping; and 5) irrigation systems.

Appropriate seed selection is among the essentials for seed germination. Seeds selected for planting should be well suited for their intended place for production. Factors to consider when selecting seeds include soil structure, temperature zone, moisture availability coordinated with moisture needs, crop rotation, companion cropping, and overall nutrition needed from soil.

Hormones within each seed and its resulting plant are also essential for germination and production. Abscisic acid (“ABA”) is a plant hormone that inhibits growth-promoting hormones like gibberellins, cytokinins, and auxins, from triggering seed germination too soon for weather conditions. The ABA hormone also regulates bud dormancy, and growing plants’ reactions to weather conditions like drought or excessive heat. Relative to drought and excessive heat conditions, ABA helps regulate stomatal closure to limit water loss from growing plants, thereby protecting them from wilting.

Auxins are hormones in plants that regulate growth by promoting cell division and elongation. Their growth -promoting functions seem most visible in stems and other plant parts above ground, although

Grass hay emerging from its winter dormancy in late March.



auxins promote some root growth as well. Gibberellins promote cell elongation and stimulate enzyme synthesis necessary for moving nutrients throughout roots, and secondarily moving nutrients throughout a growing plant, where and as

needed. Cytokinins also encourage cell division and influence allocation of nutrients where and as needed, mostly ensuring that developing seedlings have the nutrients needed to grow and mature. The products that EarthGen215 distributes bolster roots and plants' production of hormones, as well as the efficacy of those plant hormones.

Larger seeds planted with products EarthGen215 distributes placed in furrow (i.e., corn, soybeans, or any other type of beans), or applied when small grains are drill planted, have their internal hormone functions bolstered by products EarthGen215 distributes . Once a radicle emerges from its seed, it is greeted with a higher density of plant-available nutrients resulting from increased activities of beneficial soil organisms, stimulated by the products EarthGen215 distributes placed in furrow or near the newly planted seeds. Similar results in seed-hormone boosts and nutrient availability are seen where products EarthGen215 distributes are applied as recommended on existing hay fields.

Water uptake by planted seeds is another essential for seed germination. Some producers soak their seeds in water or water that contains products EarthGen215 distributes, prior to planting. Including the biological stimulant enhances the seeds' imbibition processes. The biological stimulant EarthGen215 distributes used in this part of the seeding process facilitates efficient and more complete absorption of water. Another aspect of seed selection is selecting seeds with healthy seed coats. Healthy seed coats control the rehydration process so that the seed's embryo is rehydrated gradually.

Enzymes are catalysts and thus are additional essential factors for vigorous seed germination. The biological stimulant is a compilation of plant-derived enzymes carried by water. Enzymes are proteins which make them stable and durable. The durability of enzymes enables them to serve as catalysts for their specific functions repeatedly throughout a growing season. Enzymes involved in seed germination facilitate conversion of nutrients carried in each seed into energy for growth of the radicle. Once the radicle emerges, enzymes in the soil's planting-zone and enzymes from the biological stimulant, work with the primary product that EarthGen215 distributes to make more nutrients immediately available to the radicle. The radicle is thereby equipped to grow more effectively into the plant's primary root. The primary root anchors the plant and provides the starting point for a prolific root structure. Root structures of plants treated as recommended with this product line tend to be healthier, more prolific, and function as better uptake channels for delivering water and nutrients from the soil to growing plants.

After the primary root develops, a shoot appears out of the soil. Once shoots emerge the photosynthesis processes begin, and soon cotyledons begin to grow. Photosynthesis is the process of living leaves capturing light energy from the sun, then using that energy to combine atmospheric carbon, hydrogen, and oxygen, to create a sugary substance often called photosynthate. This sugary substance is also referred to as glucose. Photosynthate flows through roots into root zones to nourish beneficial organisms there. In turn, the nourished, beneficial organisms mineralize more nutrients for uptake and assimilation by the growing, maturing plants.

Factors essential for vigorous seed germination and seedlings' early growth discussed briefly in this Newsletter include: 1) wise seed selections; 2) hormones within seeds and those produced by growing plants; 3) healthy soil structure saturated densely with plant-available soil nutrients; 4) water uptake adequate to rehydrate seed embryos gradually; 5) enzymes within seeds and enzymes in soil surrounding seeds and root-zones; and 6) photosynthesis processes. Notice that nitrogen is not among the factors essential for seed germination and seedlings' early growth.

Typically, nitrogen levels in soil are adequate for these preliminary stages of development. Working with mechanisms of seed germination can improve crop yields and quality. It also builds stronger and healthier soil structure. The products EarthGen215 distributes help throughout all growth stages and when soil is fallow.

Please call with questions as I am happy to assist you in regenerating your soil for optimum yield!!!

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