

Nutrition Tips for Seed Germination and Young Plants

Friday, December 20, 2019

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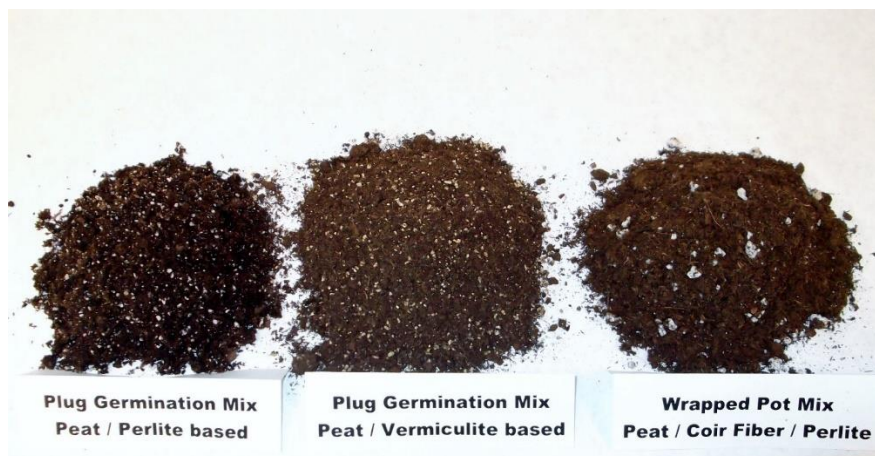


Young plants propagation. Photo Credit: istockphoto.com

Seed germination and young plant production starts with the right growing medium or substrate. It is important to have a substrate with good physical characteristics, such as air porosity and water holding capacity, however chemical characteristics are equally important. Correct starting pH, electrical conductivity and nutrient content are necessary for favorable young plant development. Once seeds are sown or cuttings stuck, the grower must monitor pH and nutrient status. Here are some tips to make the proper cultural adjustments during the crop cycle to achieve success.

Keep in mind that germinating seeds and rooting cuttings in plug trays is high density production, meaning that the developing root system is limited to a very small amount of growing medium. Therefore, nutrient status and pH can change very easily from irrigation and fertilizer applications. Knowing this, the benefit is that you can make cultural adjustments quickly and easily. However, it is also easy to get in trouble, so attention to detail is very important for small cell culture. Larger

cell plug trays and taller trays are more forgiving, since they hold more substrate and therefore, require less frequent application of irrigation water/fertilizer solution.



Examples of different growing media used for various young plant production methods. Each is specialized and growers should evaluate products to determine which growing medium is best for their growing needs.

Fertilization Requirements of Seedlings

Seedlings do not need fertilizer from sowing through the first week after germination because the cotyledons, which are preformed inside the seed, have all the initial nutrition needed to sustain seedling growth. A week after germination, seedlings require a small amount of nutrients, mainly N, P and K.

Remember, seedlings and plants will not grow faster or better by applying higher than recommended rates of fertilizer; in fact, over-fertilizing can result in a negative impact on growth (plants become stretched or distorted), algae formation on the growing medium surface which attracts shore flies and fungus gnats and build up of fertilizer salts which can burn roots and kill seedlings. Young seedlings are particularly sensitive to high fertilizer/salt levels in the substrate, so the Electrical Conductivity (EC) should be monitored and maintained below 1.5 dS/m (mmhos/cm) using the 2:1 growing medium test method. Seed germination substrates, like PRO-MIX® PGX and FPX, contain a mild, starter fertilizer charge to fulfill initial nutrient requirements of seedlings up to the formation of the first set of true leaves. PRO-MIX® YP for rooting cuttings and paper wrapped pots has a fertilizer with a low solubility, so the fertilizer is available to plants once roots begin to form on the cuttings.

Fertility Program

Keep in mind that there is no perfect fertilizer or nutrient solution for all plants. Plant nutrient needs depend on the plant species, stage of plant development, season of the year and environmental conditions. Water quality must also be considered, since dissolved minerals and water alkalinity have an impact on fertilizer selection. Many fertilizer companies offer calcium-magnesium (cal-mag) formulations for seedlings and young plants that work well, since these formulations provide higher amounts calcium, magnesium and micronutrients than standard fertilizer formulations when feeding at low nitrogen rates.



Example of iron deficiency in petunia plugs from high pH of growing medium caused by high water alkalinity and improper fertilizer selection

Depending on your water quality, it may be best to alternate with a potentially acid fertilizer, since many of the cal-mag fertilizers tend to raise growing media pH. Apply fertilizer as a constant feed, with every fourth irrigation with clear water. Fertilizer application rates can start with 50 ppm N, then increase to 100 ppm N just prior to transplant. After transplant, N can be maintained at 100 ppm or increased to 150-200 ppm N depending on the plant species. Adjust application rate based on plant response and the amount of sunlight.

Benefits of Active ingredients

PRO-MIX® FPX, PGX and YP are available as standard blends or with BIOFUNGICIDE™ for added protection for your plants from root pathogens. BIOFUNGICIDE™ is beneficial *Bacillus* bacterium that is registered with the EPA for suppression of damping off and the root rot pathogens *Fusarium*, *Pythium* and *Rhizoctonia*. It works by reducing root disease symptoms by one or a combination of mechanisms to provide a competitive advantage over the pathogen. BIOFUNGICIDE™ does this by a combination of direct destruction of pathogen, a reduction of the spread of the pathogen and/or pathogen exclusion from the site of infection at the plant root. When the plant's root system comes into contact with *Bacillus*, the bacterial spores germinate and begin to colonize the plant's roots within 48 hours. The bacteria grow around the root system to form a protective shield that serves as a physical barrier to certain root rot pathogens. Disease suppression occurs with all crops including vegetables, ornamental greenhouse plants, perennial and nursery crops. PRO-MIX® BIOFUNGICIDE™ products protect your plants and reduce incidence of root diseases.

*PRO-MIX® BIOFUNGICIDE™ growing media products are only available in the US.

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