

## The Language of the Plant - Part I

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### Getting to the Root of the Matter

The first organ that appears on the seed when it germinates is a root. The roots have sometimes been called “the brains of the plant”. It is the cell division and the cell differentiation in the root that will dictate how the plant grows for the rest of its life. All plant nutrients are absorbed by the newly formed root tissue of a plant. This is the only part of the roots that can absorb adequate nutrients. If the root does not have continuous, normal, sustainable growth, it is impossible for the plant to absorb nutrients from the soil or soil and water.

It is only in the new tissue of the root that the plant synthesizes four of its five major plant hormones. If the root does not have this continuous new growth, the plant cannot maintain it's required hormone balance throughout the plant for normal development.



After a plant seed germinates, it then undergoes a vegetative growth stage. It is during this vegetative growth period where rapid root growth occurs. Many roots and root hairs develop during the vegetative growth stage and these roots are primarily the lateral growing roots. As the plant grows, demand for nutrients increases substantially.

Maintaining healthy root growth is essential so that nutrients continue to be absorbed as new tissues develop at the tips of all of the roots.

After a plant flowers or pollinates, root growth is substantially decreased. This is a problem for the plant. As the reproductive growth stage advances, the root systems tend to decline at a greater rate. Therefore, there is less nutrient uptake by plant roots during the reproductive growth stage than there is during the vegetative growth stage of the plant. This is why nutrient deficiencies are often observed and will primarily occur during the reproductive growth stage of the plant.

The classical thinking of making new fertilizer nutrient recommendations is to soil test in order to determine the level of nutrients that are in the soil. Then, best estimates for the application of adequate fertilizer are made and fertilizer is applied to the soil in order to guarantee nutrient uptake for the complete growth cycle of the plant.

Is this always effective? *No.*

This is not always effective because root development during the reproductive growth stage can decline at such a rapid rate that it cannot absorb an adequate amount of nutrients - regardless of how high the soil tests and nutrient applications indicate.

The most essential part of plant growth that will ultimately determine the degree of growth is the maintenance of aggressive root growth during the plants life. This is particularly important during the reproductive stage of growth of the plant.

All plants go through a tremendous hormonal change as they transition from the vegetative growth stage to the reproductive growth stage. This begins at flowering or at time of pollination. If there is not continuous new cell division at the root tips as a result of continuous root growth, the plant



*Jerry Stoller is the President and CEO of the Stoller Group. In agri-business for over 40 years, Stoller is dedicated to helping producers enhance crops by maximizing the genetic expression of plants.*

will become hormonally unbalanced.

This can be easily observed from the lack of flowers, retention of flowers, and retention of fruit. This hormonal imbalance of a plant can also limit the amount of seed formation and seed quality.

The lack of hormone balance will also result in malformed fruit or fruit with numerous physi-

ological malformations. The ability of the plant to maintain aggressive root growth is primarily determined by climatic factors. Soil moisture availability, adequate temperatures, and plant population (lack of sunlight) will normally determine how the plant roots will grow and ultimately affect the sustainability of plant root growth. Therefore, it is becoming increasingly evident that crop production practices must address those factors that clearly affect a plants tendencies and ability to adjust to the changes in soil moisture, to adjust to a change in temperatures, and to adjust to the shading effect that occurs in high plant populations. These factors should always be considered in order to achieve maximum yields for any commercial crop that is raised by growers. ❖

Stoller, headquartered in Houston, Texas, is actively researching and developing plant performance products in more than 50 countries. For more information, email: [solutions@cangrow.com](mailto:solutions@cangrow.com)

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