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Perspective

Maximizing Crop Yield Potential

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Crop production in North America has changed in the last 15 years because of new breeding techniques and genetic manipulation. But that is not the only change that has helped growers become more productive. The use of biological and bio stimulants along with plant growth regulators has enabled growers to plant crops in less than ideal environments and more extreme weather patterns. The use of drones to scout fields and/or apply fungicides or insecticides has helped growers to reduce the cost of pest control, but also the need for labor. With labor to plant and harvest fruit and vegetables becoming increasingly more difficult to find after the Covid Pandemic, research and development on mechanization of fruit and vegetable operations has become a national priority with Land Grant Universities and private industry. After 80 years of research, growers finally realize the importance of soil health. What is a healthy soil?

A healthy soil has a pH between 6.0 and 7.0, at least 3.5% organic matter, optimum tilth with no compaction for optimum water infiltration rates and plant growth especially roots. A healthy soil also supports and requires microorganisms like bacteria, fungi, protozoa and earthworms. Microorganisms not only increase the ability of plants to take up nutrients - both macro and minor - but they also produce plant growth regulators that control metabolic processes in cells and tissues. With all these technologies available to growers, can they consistently produce maximum yields for the crops they are growing!

The recognition my many of the consumer population between 2019 and 2021 that climate change is a real phenomena now, certainly has influence crop producers and their management decisions. In the last 2 years in North America, weather patterns have changed dramatically with high scorching temperatures during the summers and freezing temperatures in both spring and fall that reduce yield potential. The other abiotic factor that dramatically affects crop production is rainfall – either too little (DROUGHT) or too much (FLOODS). Storms in the last 2 years have become more severe leading to crop loss and changes in crop management.

Drought conditions limit plant growth and marketable yield without significant water applications through irrigation by pivot, overhead or drip systems. Modern irrigation systems tend to be low flow, low pressure and used with moisture sensors that optimize the timing and rates of water application. These irrigation systems are required for optimum yield and quality of vegetables, small fruit and tree fruit.

Even with the best management decisions coupled with the newest technologies, mother nature still has the upper hand. While weather forecasters can predict temperature and rainfall on macro scale (large areas of land), predicting temperature and rainfall on a micro scale is currently not a reality. The real challenge for growers to harvest maximum genetic potential from their crops is to mitigate the rainfall and temperature extremes (stresses) during the crop growing season.

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