TISSUE RANKING CHEAT SHEET

CHLOROPHYLL

The chlorophyll ranking system is cut into two groups, leaf size and leaf color.

Leaf size is determined by zinc, manganese and copper nutrients. Zinc determines the leaf length; manganese determines the leaf width and copper determines how flat the leaf will be.

Leaf color consists of the following nutrients: iron, nitrogen, calcium, magnesium, silica, sulfur. All of these nutrients are important in chlorophyll production and density.

SUGAR MOVEMENT

The sugar movement ranking system consists of potassium, boron, magnesium and sulfur. Magnesium's job of transporting sugars consists of loading the sugars onto the phloem and carbon partitioning. Carbon partitioning is the process of transporting the sugars to where they are needed. Potassium plays a major role in efficient translocation of sugars through the phloem. Boron is responsible for releasing sugars through the roots, feeding biology in the soil.

SUGAR PRODUCTION

The sugar production rank consists of phosphorus and magnesium, and it will likely be tweaked as we gather more data throughout the rest of 2022.

PROTEIN ANALYSIS

The protein analysis ranking system consists of nitrogen, sulfur, molybdenum and copper. Nitrogen is the plant's source of protein. The plant takes up nitrogen in three forms: NO3, NH4 and NH2. These forms go through a process to be converted into amino acids, the amino acids will then make up a protein. Sulfur is essential for multiple enzymes contributing to nitrogen fixation and conversion into a protein. Molybdenum and copper make up most of these important enzymes that convert nitrogen into a protein.

DEFENSE RESPONSE

The defense response ranking system is cut into two groups, cell wall strength and disease resistance.

Cell wall strength is determined by silica, boron and calcium. Boron and calcium make up calcium pectate which is responsible for holding together the plant's cell walls. Silica is a nutrient that reinforces calcium pectate.

Disease resistance is determined by copper, potassium and sulfur. Copper has been found to decrease the spread of disease throughout the plant. Potassium has been shown to limit plant stress through drought and heat stress. Sulfur limits disease by activating enzymes to convert nitrate into protein. Nitrate elongates cell walls making them thinner, making the plant more vulnerable for disease and insect pressure.

**** Depending on crop type and crop stage, each nutrient is weighted differently and the levels needed at each stage will change.*