



## Grape Bloom

By Robert Smith, Agronomist, Ultra Gro

At 80+ degrees, grape buds have started to push, and bloom is rapidly approaching. Now is the time to plan your grape foliar nutrient program. Foliar feeding provides an excellent solution when the plant root system is not functioning optimally or nutrition via the soil is deficient or unavailable. Foliar fertilizers are also perfect for use as a preventive tool to avoid deficiencies and reduce stress situations.

Plants absorb foliar sprays 20 times faster than soil-applied nutrients. Foliar applied nutrients help plants compensate for soil deficiencies (low fertility, low soil temperature, etc.) during periods of peak demand.

Grapes, like other crops, require adequate supplies of all essential plant nutrients for optimum growth and yield. Most soils contain adequate or near-adequate quantities of all nutrients. Nitrogen, phosphorous, potassium, magnesium, and boron are the nutrients most likely to limit grape production.

Balancing yield and quality in grapes require a balanced nutrient management approach that considers appropriate soil and foliar applied nutrition to meet crop demands. Primary and secondary nutrients are required in the greatest amounts and micronutrients are typically required less, though just as essential. During grape pre-bloom and bloom key nutrients for a successful crop and healthy vine are calcium, zinc and boron.

During shoot expansion in grape vines, there is a short window to get the micronutrients critical to chlorophyll production, photosynthesis, and energy production into the leaves. A foliar application during leaf expansion helps kick start grape vines and carbohydrate production needed to maximize berry set and bunch size.

Calcium (Ca), in the form of calcium pectate, is responsible for holding together the cell walls of plants. Promotes proper plant cell elongation. Strengthen cell wall structure – calcium is an essential part of plant cell wall. When calcium is deficient, new tissue such as root tips, young leaves, and shoot tips often exhibit distorted growth from improper cell wall formation. Calcium is also used in activating certain enzymes and to send signals that coordinate certain cellular activities. It plays an important role in helping the plant protect itself against diseases – numerous fungi and bacteria secrete enzymes which impair plant cell wall. Ca helps in protecting the plant against heat stress – calcium improves stomata function and participates in induction of heat shock proteins. Stronger cell walls, induced by calcium, can avoid the invasion. Calcium affects fruit quality. It has a role in the regulation of the stomata. Deficiencies in grapes will result in poor fruit maturity, softer berry skins and poor overall grape quality. Almost half of the vine's calcium absorption occurs from leaf emergence and fruit set.

Zinc (Zn), one of the essential micronutrients and an important constituent of several enzymes and proteins, is only needed by plants in small quantities. However, it is crucial to plant development,



as it plays a significant part in a wide range of processes. It plays an important role in a wide range of processes, such as: growth hormone production, internode elongation and flower development. It is used in the formation of chlorophyll and some carbohydrates, conversion of starches to sugars. Deficiencies in grapes will lead to poor fruit set, stunted shoots, undersized fruit, loose clusters, and unevenly ripening fruit.

Boron (B) is not required by plants in high amounts but can cause serious growth problems if it is deficient. Boron is used with calcium in cell wall synthesis and is essential for cell division (creating new plant cells). Boron requirements are much higher for reproductive growth, so it helps with pollination, and fruit development. Other functions include translocation of sugars and carbohydrates, nitrogen metabolism, formation of certain proteins, regulation of hormone levels and transportation of potassium to stomata (which helps regulate internal water balance). Since boron helps transport sugars, its deficiency causes a reduction of exudates and sugars from plant roots, which can reduce the attraction and colonization of mycorrhizal fungi. Deficient boron in grapes will lead to shot berries, uneven ripening, and poor fruit set.

Optimal timing is to get the pre-bloom nutrients applied just as the small clusters are emerging from the shoot, and possibly 7 days later for a second application. And finally, for those varieties that historically set poorly, a third application at bloom can be beneficial.