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# Stages of Plant Nutrient Importance – Part 2 of 4

## Bud & Flower Optimisation Webinar

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### Questions and Answers – Page 1

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*Q. We use a lot of Calcium Chloride through the season but still experience bitter pit in some varieties - why is this?*

A. Question answered live - this is typically due to not a lack of applied Calcium, but more an excess of Potassium antagonising the Calcium. We have observed that applying Manganese will help regulate the Potassium. Chloride is antagonistic to the reproductive function of the plant, so using this product through flowering or cell division will have detrimental effects.

*Q. You are equating Ca++ to energy... please explain?*

A. Ca<sup>++</sup> has an ionization energy of approximately 8.7172eV, but this does not directly equate to energy, but more to the production of energy within the plant. One of Calcium's main functions is to help provide the regulation of intra-cellular energy transfer. There are 2 recognised functions of Calcium; one being a key role in cross linking acidic pectin residues, the other being a role in the cellular membrane system. Calcium is the subject of ongoing research today.

*Q. Can you please provide some detail on iron's influence/importance during those early stages and where it fits in relation to hormone balance.*

A. Iron plays a key role in chlorophyll production and therefore it becomes more critical to manage once the plant has leaves and is photosynthesising. Iron is directly used in the production of RNA reductase and is also involved in the carotenoid staircase, which affects the plant's effectiveness at absorbing and using sunlight and photons. This is the precursor to the production of protein.

*Q. Doesn't the plant know what mineral it needs at each stage of growth... talking the the microbes in the soil?*

A. Yes, microbes have a role in sequestering nutrient from the soil, however in orchard floors typically the soil biota is compromised due to herbicide, pesticide and fungicide usage therefore we have observed that trees respond strongly to supplementation during critical stages of the crop cycle

*Q. How do I know when cell division is finished?*

A. Question answered live – it is difficult to say precisely when this is, but it is typically 10-14 days after each flower has been pollinated. Often 60% of cell division has happened by the stage which we commonly recognise as full bloom due to the majority of the flowers being pollinated.

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### Questions and Answers – Page 2

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*Q. Can we get access to research articles that you are referring to in relation to calcium etc*

A. See below a few of the articles we referenced – there are many many more available.

- Brewbaker, James L., and Beyoung H. Kwack. “The Essential Role of Calcium Ion in Pollen Germination and Pollen Tube Growth.” American Journal of Botany, vol. 50, no. 9, 1963, pp. 859–865. JSTOR, [www.jstor.org/stable/2439772](http://www.jstor.org/stable/2439772). Accessed 17 Aug. 2020.
- Steinhorst L, Kudla J. Calcium - a central regulator of pollen germination and tube growth. Biochim Biophys Acta. 2013;1833(7):1573-1581. doi:10.1016/j.bbamcr.2012.10.009
- PHILIP J. WHITE, MARTIN R. BROADLEY, Calcium in Plants, Annals of Botany, Volume 92, Issue 4, October 2003, Pages 487–511, <https://doi.org/10.1093/aob/mcg164>

*Q. Joe said calcium available from the ground via the roots for plant to make use of subsequent nutrients applied via foliar. Does this suggest foliar applications of calcium WITH reproductive Foliar trace element can never make up for inadequate calcium soil availability?*

A. There is no substitute for plant availability of Calcium in the soil, however high soil Calcium levels are no guarantee of plant availability of this element. Soil balance is key for nutrient mobilization into the plant, you can't foliar spray your way out of a major element deficiency in the tree foliar spraying major elements is a bandage for the real problem. A major role of Calcium in the cell is for cell communication & energy transfer, this is why it is so critically important in foliar application effectiveness.

*Q. Can we apply the same principles to legume broadacre crops...peas, vetch, etc.*

A. Answered live - yes, these principles apply across all flowering plants.

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