

Calcium in Tomatoes

Organic-Ca:

- Rapidly available Calcium and Boron
- Formulated to achieve higher Ca uptake
- Corrects Calcium deficiencies



Why Calcium

Calcium can be difficult to make available to plants at the right time. To significantly improve plant & fruit calcium levels in high yielding crops, calcium is required both as a soil and foliar spray.

Key issues

- Mobility of calcium around the plant
- Absorption of calcium from the soil at the rate required for maximum yield and quality.

Calcium plays a key role in plant growth and quality of produce by:

- Linking the structure of cell walls and strengthening cell membranes (pectins).
- Enhancing nutrient uptake of other nutrients by the root system (regulation of protein pump.)
- Regulating osmotic pressure in the cell, and thereby directly influencing the salt balance within plant cells.
- Activating potassium to regulate the opening and closing of stomata to allow water movement from the plant.
- Enhancing pollen germination.

Calcium influences the growth and health of cells and conductive tissues. It has a specific influence on tomato fruit quality, especially blossom end rot.

Effect of calcium on tomato growth stages

Stage of Growth	Calcium effect on growth
Establishment	Enhances root and leaf growth
Vegetative Growth	Sustains strong plant growth; nutrient uptake; moisture balance
Flowering to Fruit Set	Maximizes reproductive development
Fruit Ripening to Maturity	Fruit firmness, quality; reduction of blossom end rot.

Getting Calcium to the fruit

A tomato fruit needs calcium to grow and maintain its integrity. Calcium acts like a glue in cells – it holds them together, making fruit firmer.

Tomato plants cannot mobilise enough calcium to the fruit (supplied by phloem) and relies on the immediate supply of Ca in the xylem, which is dependent on transpiration.

If a tomato grows quickly, or if other conditions slow water absorption (lack of transpiration), then calcium doesn't have enough time to travel through every part of the fruit. In this situation the plant can't absorb enough calcium, even if there is enough in the soil. This results in tomato tissue break down and characteristic damage on the end of the fruit (blossom end rot).

Conditions that can slow water and/or calcium absorption can include:

- Inconsistent watering
- Root damage
- Cold temperatures
- Excessive heat
- High soil nitrogen (lowers calcium uptake)
- Saline soil (lowers the availability of calcium)
- Highly acidic or alkaline soil (pH imbalance prevents calcium absorption)



Quality fruit treated with Organic-Ca & Organic-N

Maximise calcium uptake



Organic -Ca improves Calcium uptake:

1. Contains Boron

Organic-Ca contains Boron. Boron is important in improving calcium movement in the plant and the transport of sugars and plant growth regulators. It plays a key role in flower pollination, fruit formation and in maintaining the integrity of the fruit skin.

Calcium and boron both benefit from each other, and without the other, the success of both is limited. In order for plants to effectively use calcium, boron must also be present in an appropriate amount. If the plant does not have sufficient levels of boron in the tissue, calcium applications are not nearly as effective as if there was sufficient boron present.

2. Contains Amino Acids that influence the opening of stomata

Organic - Ca contains the following naturally derived amino acids which are involved in opening the stomata:

Glutamic acid:	1.6%
Alanine:	0.29%
Aspartic:	0.24%
Proline:	0.092%



Organic-Ca structure ensures the union among calcium, boron and amino acids; improving absorption as well as mobility.

Opened stomata mean:

- More transpiration in the plant so there is more uptake of calcium by the root system
- More calcium can get into leaves and fruit via foliar sprays

3. Soil and Leaf application

It is particularly important to ensure available soil calcium levels are optimal with the use of soluble calcium via irrigation to improve calcium uptake by the root system.

A point to remember is that calcium can be absorbed only by the young root tips that are not suberized. This area is behind the root tip. Encouraging good root health is essential. We recommend Super Kelp (root growth, stress tolerance) or Vitazyme (root growth, stress tolerance, photosynthesis, multiple modes of action).

Program to Maximise Calcium Uptake

Three key actions to maximise calcium uptake

- 1) Apply Organic-Ca (includes boron) to soil and leaf
 - Via irrigation 5L/ha; two times during vegetative growth and early flowering.
 - Foliar 100-300mL/100L; 3-4 times from fruit set to maturity
- 2) Stimulate root growth to maintain calcium uptake with:
 - Vitazyme, or
 - Super Kelp
- 3) Improving soil health to maintain calcium availability & suppress disease:
 - Humus 26 – Apply active soil carbon
 - Fish Plus – Stimulate microbial activity
 - MicroPlus & Actinobact – Inoculate for microbial diversity



Organic-Ca

Organic-Ca improves fruit quality post harvest.
(#'s represent days post harvest)

Regular source
of Ca