

# ZUCCHINIS

## HOW TO AVOID CALCIUM DEFICIENCIES



TIMAC AGRO ADVICE KIT



### HOW TO IMPROVE FRUIT SET & FRUIT QUALITY BY AVOIDING CALCIUM DEFICIENCIES?

Apical necrosis in zucchinis is a physiological disorder characterized by the rot of the blossom end of the fruit. It is caused by a lack of calcium and is enhanced by poor irrigation. This deficiency will increase permeability and deterioration of fruit cell membranes, followed by loss of turgor. Indeed, calcium needs to be transported by water (transpiration mechanism) to reach the different organs.

Blossom-end rot can cause up to **50%** yield losses in some circumstances

#### 1 TIMAC AGRO INSIGHT

Calcium is an essential nutrient for all crops:

CELL LEVEL	NUTRITION LEVEL	METABOLIC LEVEL	RESISTANCE LEVEL
<ul style="list-style-type: none"> <li>Performs structural functions</li> <li>Stabilizes cell wall strength &amp; rigidity</li> <li>Reinforces tissue integrity</li> </ul>	<ul style="list-style-type: none"> <li>Promotes the proper rooting of plants</li> <li>Enables water and nutrient uptakes</li> </ul>	<ul style="list-style-type: none"> <li>Regulates enzymes activity in metabolic processes</li> <li>Promotes fruits formation and conservation (firmness)</li> </ul>	<ul style="list-style-type: none"> <li>Alleviates the effects of stress</li> <li>Enhances tissue resistance to fungal or bacterial attack</li> <li>Increases plant health</li> </ul>

In zucchini, a deficiency in calcium can lead to several issues:

- Necrotic leaves
- Reduced strength of the organs
- Inhibition of root tips growth
- Fruit set issues
- Fruits malformation & blossom-end rot

Zucchini, Technical and interprofessional center of fruits & vegetables, FRANCE

Yield (t/ha)	Total exportation in kg/ha (lb/ac) needs for zucchinis				
	N	P2O5	K2O	MgO	CaO
80 t/ha	300 (267)	80 (71)	450 (400)	80 (71)	150 (134)

First step is to maintain neutral soil pH to improve calcium availability as well as adequate soil moisture to optimize soil calcium transportation. Farmers also need to control the nitrogen fertilization, because excess can inhibit the calcium uptakes. But sometimes, it is not enough, and farmers will need to act in order to preserve the zucchini fruit set, fruit quality and conservation.

(Source: Fruit calcium: Transport and Physiology Bradleigh Hocking<sup>1,2</sup>, Stephen D. Tyerman<sup>1</sup>, Rachel A. Burton<sup>2</sup> and Matthew Gilliham et Al. calcium—Nutrient and Messenger Kathrin Thor et Al. Dimka Haitova Yield, water requirement, nutrient uptake and fruit quality of zucchini squash grown in soil and closed soilless culture Youssef Roupahel)



<http://ephytia.inra.fr/en/C/8132/>  
Zucchini-squash-Blossom-end-rot



## 2 TIMAC AGRO SOLUTIONS

TIMAC AGRO technologies recommended to improve calcium uptakes in order to avoid blossom-end rot are: KSC Phyt-Actyl (Fertigation) and Fertileader (foliar biostimulant).

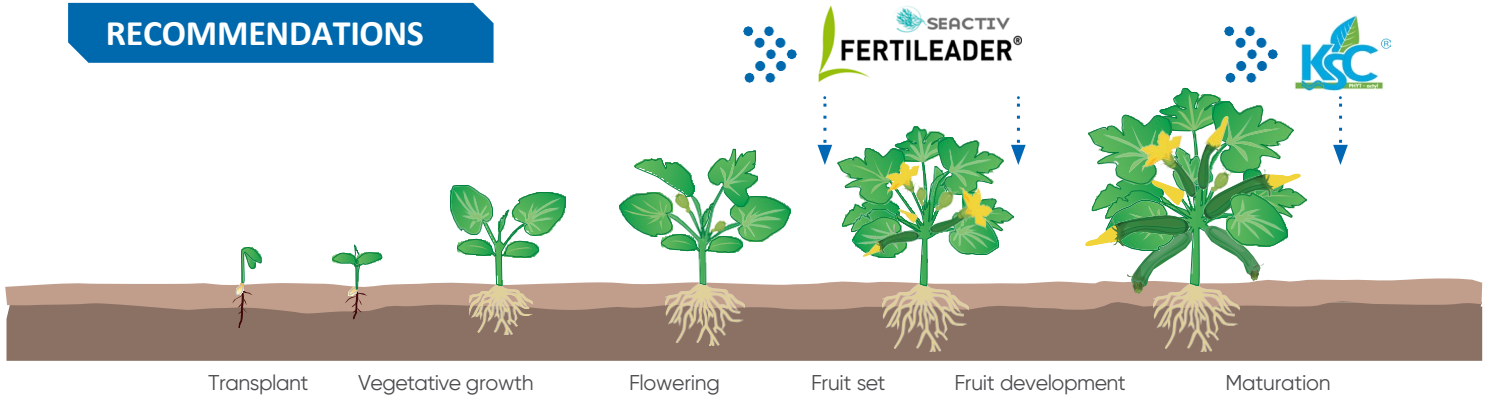


- improves nutrient absorption
- Increases in root growth
- Improves flowering/fruit set and fruit fill



- improves nutrient absorption
- increases the plant's efficient use of water
- improves flowering/fruit set and fruit fill

### RECOMMENDATIONS



### ZOOM ON THE TECHNOLOGIES



The SEACTIV Complex helps the plant to manage the stresses undergone throughout its growth, to maintain the performance of the crops.

1. Improves crop tolerance to abiotic stress :
  - Maintains cell osmotic pressure
  - Detoxifies the cells from ROS
2. Maintains metabolic activity of the plants under stress conditions:
  - Stimulates the photosynthetic activity
  - Stimulates the production of chloroplasts by the plants
3. Improves nutrient assimilation and efficiency :
  - Better redistribution of nutrients
  - Quicker absorption of trace elements



KSC Phyt-Actyl is the unique watersoluble range with a triple action on plant, soil and specific nutrition composed of seaweed extracts.

- Supports crop growth in all conditions
  - Ensures phenological stage transition
  - Contains high quality raw material adapted to fertigation features (pH, EC)
  - Water-soluble fertilizer with some biostimulant effects
  - Adapted formulas and efficient nutrition during all the crop cycle
- To ensure good growth of the fruits, we must provide complete nutrition with KSC range, with the Seactiv complex addition for critical stages of the cycle

Products	FERTILEADER MagiCAL (3-0-0 + 8.6 Ca + 2.4 Mg)	KSC VII (15-0-9 + 20 Ca)
Application stage	<ul style="list-style-type: none"> <li>• Fruit set</li> <li>• Fruit maturation</li> </ul>	<ul style="list-style-type: none"> <li>• Fruit ripening do not mix with other KSC in the tank</li> </ul>
Application methods	Foliar application	Fertigation
Dosage	2 x 1.5 L/ac	13 – 22 lb/ac
Action	<ul style="list-style-type: none"> <li>• Ca brought by foliar application will prevent blossom-end rot apparition</li> </ul>	<ul style="list-style-type: none"> <li>• N &amp; K will secure ripening</li> <li>• Ca brought directly to the roots will help fruit quality and conservation properties</li> </ul>

### TIPS...

To ensure a good fruit set in zucchinis, even-though calcium uptake will help, it is still essential to have a good pollination, otherwise the fruit cannot form. If you have not enough insects to pollinate, it is preferable to use parthenocarpic varieties!