POST
HARVEST
_CARE

extending shelf-life by BIOON

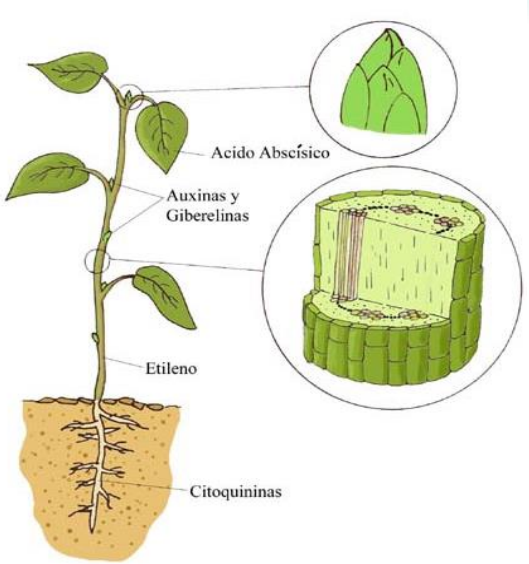
TOMATO

What is ethylene?

Plant hormone that regulates processes associated with **ripening and senescence.**

Accumulates in storage chambers and transport containers.

Physiologically active at **very low concentrations** (0.015 ppm).



Ethylene effects

Ethylene contamination in the distribution chain accelerates **ripening, spoilage and rotting** of fruits/vegetables (= economic and quality loss).

Some **fruit pathogenic fungi** produce ethylene to stimulate **fruit ripening.** In addition, ethylene (and also other gases emitted by the fruit) stimulate the development of some **fungal spores.**

Ethylene **production and sensitivity to ethylene** depends on **different factors:**

- Species and cultivar
- Temperature
- CO2/O2 levels
- Physiological age
- Stress

Tomato and ethylene

Tomato is a **climacteric** fruit.

Production Ethylene	1,2 – 1,5 µL/kg*h a 10ºC 4,3 – 4,9 µL/kg*h a 20ºC
Optimum Temperature Preservation	Mature Green (Stage 2): 12.5 - 15ºC Light Red (Stage 4-5): 10 - 12.5ºC Mature (Stage 6-7): 7 - 10ºC

Response to ethylene:

• Tomatoes are sensitive to **exogenous ethylene** and exposure of light ripe fruit will initiate ripening.

• Ripe tomatoes **produce ethylene moderately** and storage or transport with sensitive produce, such as lettuce or cucumbers, should be avoided.

Tomato and ethylene

- **Accelerates** ripening and **over-ripening.**
- Softening (loss of hardness).
- Color change.
- **Rot and fungal infect**ion (Botrytis cinerea, Alternaria Alternata, Geotrichum Candidum...).
- Higher symptoms of **chilling injury.**
- **Wrinkling and weight loss** caused by respiration.
- **Low lot homogeneity** after artificial ripening.

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Geotrichum Candidum

Agricultural Research Organization, The Volcani Center, Bet Dagan, Israel, and The Hebrew University of Jerusalem, Rehovot, Israel

Stimulation of Fruit Ethylene Production by Wounding and by *Botrytis cinerea* and *Geotrichum candidum* Infection in Normal and Non-Ripening Tomatoes

RIVKA BARKAI-GOLAN, GILA LAVY-MEIR and E. KOPELIOVITCH

Abstract

Inoculations with both *Botrytis cinerea* and *Geotrichum candidum* stimulated ethylene evolution in the pre-climacteric normal tomato fruit and the non-ripening *nor* mutant which did not show any rise in ethylene when uninfected. In the post-climacteric normal fruits, new peaks in ethylene production were formed. The rise in ethylene evolution in all types of infected fruits has already been detected during the incubation period of the disease. Ethylene peaks were detected earlier and were higher in fruits infected with *B. cinerea* than with *G. candidum*, coinciding with the faster rate of growth of the former. Mechanical wounding also stimulated ethylene synthesis by the non-ripening fruits, production being directly proportional to wound dimension. Considerably higher rates of ethylene were recorded for infected fruits than for mechanically-injured fruits in which wound dimensions were similar to those of lesion development.

Alternaria Alternata

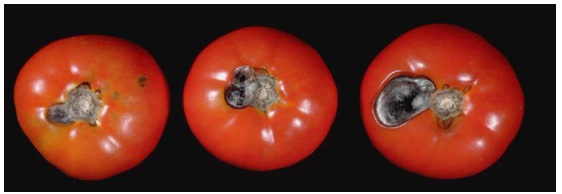
Involvement of ethylene in spore germination and mycelial growth of **Alternaria Alternata**

Abstract:

Aminoethoxyvinylglycine, an ethylene synthesis inhibitor, and 2,5-norbornadiene, a competitive inhibitor of ethylene binding**, inhibited development of the fungus Alternaria alternata.**

The inhibition was reduced by 1-aminocyclopropane-1-carboxylic acid.

The results suggest that **endogenous ethylene** synthesis and action are essential for the growth processes of **A. alternata**. Mycol Res 98(1):118-120(1994)



Después de 10 días a 5ºC

Geotrichum Candidum

BION **retrasa la maduración** (evolución de la dureza y acidez) y **deterioro**.

	Color	Hardness	ºBrix	Acidity	Impairment
Principle	6	7	2,75	4,8	0
Control	6	3	3,4	4,5	50
BION	**6**	**5**	**3,25**	**4,6**	**27**

Tomato preserved at room temperature covered with PVC film with and without BION.

BION

Control

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THANK YOU