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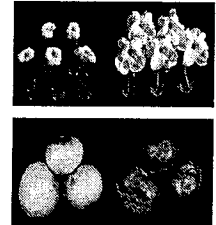
“Ethylene and Plant Quality: the Good, the Bad and the Ugly”

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Ethylene (C₂H₄)

- A plant hormone
- Often called fruit ripening hormone
- Gas
- Produced by all plants
- Many plants are sensitive to ethylene



Anything that increases ethylene production by the flower hastens senescence

- High temperatures
- Pollination
- Exposure to ethylene
- Wounding
 - mechanical damage
 - insects
 - disease

Ethylene sensitivity

- Flowers are more sensitive than leaves
- Species differences
- Cultivar differences
- Developmental stages
- Environment (especially temperature)

Ethylene sensitivity

Sensitive flowers	Insensitive flowers
• Carnation	• Anthurium
• Petunia	• Gerbera
• Orchids	• Tulip
• Snapdragon	• Chrysanthemum
• Geraniums	• African Violets
• Fuchsia	• Cyclamen
• Streptocarpus	

Responses to ethylene exposure

Crop	Symptoms of ethylene damage
Carnation	In-rolling of petals, sleepiness
Petunia	Flower wilting
Orchid	Bloom fall
Snapdragon	Bloom abscission
Geranium	Petal abscission, leaf yellowing
Fuchsia	Bloom abscission
Streptocarpus	Flower and bud abscission

The severity of the ethylene injury is affected by many factors

- ethylene sensitivity of the plant
- concentration of ethylene
- duration of exposure
- temperature
- *example: Exposure to 1ppm ethylene*
 - 24 h for carnation wilting
 - 1 h for geranium petal abscission

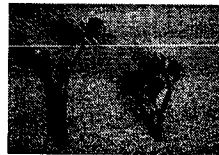
Sources of ethylene in the greenhouse

- Flowers
- Fruits
- Gas-powered forklifts
- Propane heaters
- Cigarette smoke

How can you prevent ethylene injury?

- Reduce exposure to ethylene
 - Remove sources of ethylene
 - Ethylene scrubbers
 - Proper ventilation
- Younger developmental stages
- Reduce production and sensitivity to ethylene
 - chemical treatments (Ethyl Bloc or 1-MCP)
 - choice of plant material

Flore: The Good Ethylene



- Stimulates lateral branching
- Inhibits internode elongation
- Prevents flower initiation



- Fuller more compact plant
- Cutting with no flowers

Flore is ethylene



Figure 16-8. Florel toxicity

- Don't apply Florel:
- High temperatures
 - Plants are stressed

Ethylene toxicity will be the result: the good becomes the ugly

Conclusions

- Ethylene is needed for normal plant growth and development
- Ethylene treatments at the right concentration and developmental stage can enhance plant quality
- Too much ethylene causes petal shattering, leaf yellowing and plant death.