

:: The Impact Of Ethylene ::

Ethylene production and sensitivity levels of fresh produce , flowers and nursery stock

FRUITS AND VEGETABLES	RATE OF ETHYLENE PRODUCTION	LEVEL OF ETHYLENE SENSITIVITY	PRINCIPLE REACTION TO ETHYLENE GAS
APPLES	VH	H	Scald, lose crunch
APRICOTS	H	H	Decay
ASIAN PEARS	H	H	Decay
ASPARAGUS	VL	M	Toughness
AVOCADOS	H	H	Decay
BANANAS	M	H	Decay
BERRIES	VL-L	L	Mold
BROCCOLI	VL	H	Yellowing
BRUSSEL SPROUTS	VL	H	Yellowing
CANTELOUPE	H	M	Decay
CARROTS	VL	L	Bitterness
CHARD	VL	H	Decay
CHERIMOYA	VH	H	Decay
CHERRIES	VL	L	Softening
CUCUMBERS	L	H	Yellowing
GRAPEFRUIT	VL	M	Mold
GRAPES	VL	L	Mold
KIWI FRUIT	L	H	Decay
LEMONS, LIME	VL	M	Mold
LETTUCE, LEAFY GREENS	VL	H	Russet spotting
MANGOES	M	H	Decay
MELONS	M	H	Decay
NECTARINES	H	H	Nectarines
ONIONS, GARLIC	VL	L	Odour, Sprouting
ORANGES	VL	M	Mold, rind breakdown
PAPAYA	H	H	Decay
PASSION FRUIT	VH	H	Decay
PEACHES	H	H	Decay
PEARS	H	H	Decay
PERSIMMONS	L	H	Decay
PLUMS, PRUNES	M	H	Decay
POTATOES	VL	M	Sprouting
QUINCES	L	H	Decay
TOMATOES	M	H	Shrink, decay
WATERMELONS	L	H	Lose firmness
FLORAL & NURSERY COMMODITIES			
CUT FLOWERS (CARNATIONS)	VL	H	Sleepiness, leaf curl
CUT FLOWERS (ROSES)	VL	H	Premature Opening
FLOWER BULBS	VL	H	Shrink, retards growth
NURSERY STOCK	VL	H	Slower start

VL very low

L low

M medium

H high

VH very high

CLASSIFICATION OF ETHYLENE SENSITIVITIES

L – low =

3-5ppm

M - medium =

0.5-3ppm

H – high =

0.01-0.5ppm

:: Extra On Ethylene Sensitivity Table ::

Common name	Scientific name	Storage temperature		Relative humidity	Highest freezing temperature		Ethylene* production	Ethylene** sensitivity	Estimated shelf-life	Observations and Beneficial CA conditions
		°C	°F		°C	°F				
Acerola; Barbados cherry	<i>Malpighia glabra</i>	0	32	85-90	-1.4	29.4			6-8 weeks	
African horned melon; kiwano	<i>Cucumis africanus</i>	13-15	55-60	90			L	M	6 months	
Amaranth; Pigweed	<i>Amaranthus spp.</i>	0-2	32-36	95-100			VL	M	10-14 days	
Anise; Fennel	<i>Foeniculum vulgare</i>	0-2	32-36	90-95	-1.1	30.1			2-3 weeks	
Apple	<i>Malus pumila</i>									2-3% O ₂ + 1-2% CO ₂
--not chilling sensitive		-1.1	30.0	90-95	-1.5	29.3	VH	H	3-6 months	
--chilling sensitive	Yellow Newtown, Grimes Golden, McIntosh	4	40	90-95	-1.5	29.3	VH	H	1-2 months	
Apricot	<i>Prunus armeniaca</i>	-0.5-0	31-32	90-95	-1.1	30.1	M	H	1-3 weeks	2-3% O ₂ + 2-3% CO ₂
Artichoke										
--Globe artichoke	<i>Cynara scolymus</i>	0	32	95-100	-1.2	29.9	VL	L	2-3 weeks	2-3% O ₂ + 3-5% CO ₂
--Chinese artichoke	<i>Stachys affinia</i>	0	32	90-95			VL	VL	1-2 weeks	
--Jerusalem artichoke	<i>Helianthus tuberosus</i>	-0.5-0	31-32	90-95	-2.5	27.5	VL	L	4 months	
Arugula	<i>Eruca vesicaria var. sativa</i>	0	32	95-100			VL	H	7-10 days	
Asian Pear, Nashi	<i>Pyrus serotina; P. pyrifolia</i>	1	34	90-95	-1.6	29.2	H	H	4-6 months	
Asparagus, green, white	<i>Asparagus officinalis</i>	2.5	36	95-100	-0.6	30.9	VL	M	2-3 weeks	5-12% CO ₂ in air
Atemoya	<i>Annona squamosa x A. cherimola</i>	13	55	85-90			H	H	4-6 weeks	3-5% O ₂ + 5-10% CO ₂
Avocado	<i>Persea americana</i>									
--cv Fuerte, Hass		3-7	37-45	85-90	-1.6	29.9	H	H	2-4 weeks	2-5% O ₂ + 3-10% CO ₂
--cv. Fuchs, Pollock		13	55	85-90	-0.9	30.4	H	H	2 weeks	
--cv. Lula, Booth-1		4	40	90-95	-0.9	30.4	H	H	4-8 weeks	

*Ethylene production rate:
 VL = very low (<0.1 µL/kg-hr at 20°C)
 L = low (0.1=1.0 µL/kg-hr)
 M = moderate (1.0-10.0 µL/kg-hr)
 H = high (10-100 µL/kg-hr)
 VH = very high (>100 µL/kg-hr)

**Ethylene sensitivity (detrimental effects include yellowing, softening, increased decay, loss of leaves, browning)
 L = low sensitivity
 M = moderately sensitive
 H = highly sensitive

Common name	Scientific name	Storage temperature		Relative humidity	Highest freezing temperature		Ethylene* production	Ethylene** sensitivity	Estimated shelf-life	Observations and Beneficial CA conditions
		°C	°F		°C	°F				
Babaco, Mt. papaya	<i>Carica candamarcensis</i>	7	45	85-90					1-3 weeks	
Banana	<i>Musa paradisiaca var. sapientum</i>	13-15	56-59	90-95	-0.8	<>	M	H	1-4 weeks	2-5% O ₂ + 2-5% CO ₂
Barbados cherry	see Acerola									
Beans	<i>Beans</i>									
--Snap; wax; green	<i>Phaseolus vulgaris</i>	4-7	40-45	95	-0.7	30.7	L	M	7-10 days	2-3% O ₂ + 4-7% CO ₂
--Fava, broad beans	<i>Vicia faba</i>	0	32	90-95					1-2 weeks	
--Lima beans	<i>Phaseolus lunatus</i>	5-6	41-43	95	-0.6	31.0	L	M	5-7 days	

--Winged Bean	<i>Psophocarpus tetragonolobus</i>	10	50	90					4 weeks	
--Long bean; yard-long bean	<i>Vigna sesquipedalis</i>	4-7	40-45	90-95			L	M	7-10 days	
Beet, bunched	<i>Beta vulgaris</i>	0	32	98-100	-0.4	31.3	VL	L	10-14 days	
Beet, topped		0	32	98-100	-0.9	30.3	VL	L	4 months	
Berries										
--Blackberries	<i>Rubus spp.</i>	-0.5-0	31-32	90-95	-0.8	30.6	L	L	3-6 days	5-10% O ₂ + 15-20% CO ₂
--Blueberries	<i>Vaccinium corymbosum</i>	-0.5-0	31-32	90-95	-1.3	29.7	L	L	10-18 days	2-5% O ₂ + 12-20% CO ₂
--Cranberry	<i>Vaccinium macrocarpon</i>	2-5	35-41	90-95	-0.9	30.4	L	L	8-16 weeks	1-2% O ₂ 5% CO ₂
--Dewberry	<i>Rubus spp.</i>	-0.5-0	31-32	90-95	-1.3	29.7	L	L	2-3 days	
--Elderberry	<i>Rubus spp.</i>	0.5-0	31-32	90-95	-1.1	30.0	L	L	2-3 days	
--Raspberries	<i>Rubus idaeus</i>	-0.5-0	31-32	90-95	-1.3	29.7	L	L	10-18 days	5-10% O ₂ + 15-20%CO ₂
--Strawberry	<i>Fragaria spp. </i></i>	0	32	90-95	-0.8	30.6	L	L	7-10 days	5-10% O ₂ + 15-20%CO ₂
Bittermelon; < Bitter	<i>Momordica charantia</i>	10-12	50-54	85-90			L	M	2-3 weeks	2-3 O ₂ + 5% CO ₂
Black salsify; Scorzonera	<i>Scorzonera hispanica</i>	0-1	32-34	95-98			VL	L	6 months	
Bok choy	<i>Brassica chinensis</i>	0	32	95-100			VL	H	3 weeks	
Breadfruit	<i>Artocarpus altilis</i>	13-15	55-60	85-90					2-6 weeks	
Broccoli	<i>B. oleracea var. Italica</i>	0	32	95-100	-0.6	30.9	VL	H	10-14 days	1-2% O ₂ + 5-10% CO ₂
Brussel Sprouts	<i>B. oleracea var. Gemnifera</i>	0	32	95-100	-0.8	30.5	VL	H	3-5 weeks	1-2% O ₂ + 5-7% CO ₂

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		°C	°F		°C	°F				
Cabbage										
--Chinese; Napa	<i>Brassica campestris var. Pekinensis</i>	0	32	95-100	-0.9	30.4	VL	H	2-3 months	1-2% O ₂ + 0-5% CO ₂
--Common early crop	<i>B. oleracea var. Capitata</i>	0	32	98-100	-0.9	30.4	VL	H	3-6 weeks	
--Late crop	"	0	32	95-100	-0.9	30.4	VL	H	5-6 months	3-5% O ₂ + 3-7% CO ₂
Cactus leaves, Nopalitos	<i>Opuntia spp.</i>	5-10	41-50	90-95			VL	M	2-3 weeks	
Cactus fruit; Prickly pear fruit	<i>Opuntia spp.</i>	5	41	85-90	-1.8	28.7	VL	M	3 weeks	
Caimito	see Sapotes									
Calamondin	see Citrus									
Canistel	see Sapotes									
Carambola, Starfruit	<i>Averrhoa carambola</i>	9-10	48-50	85-90	-1.2	29.8			3-4 weeks	
Carrots, topped	<i>Daucus carota</i>	0	32	98-100	-1.4	29.5	VL	H	6-8 months	no CA benefit
bunched; immature	"	0	32	98-100	-1.4	29.5	VL	H	10-14 days	ethylene causes bitterness
Cashew apple	<i>Anacardium occidentale</i>	0-2	32-36	85-90					5 weeks	
Cassava, Yucca, manioc	<i>Manihot esculenta</i>	0-5	32-41	85-90			VL	L	1-2 months	no CA benefit
Cauliflower	<i>B. oleracea var. Botrytis</i>	0	32	95-98	-0.8	30.6	VL	H	3-4 weeks	2-5% O ₂ + 2-5% CO ₂

Celeriac	<i>Apium graveolens</i> var. <i>Rapaceum</i>	0	32	98-100	-0.9	30.3	VL	L	6-8 months	2-%O ₂ + 2-3% CO ₂
Celery	<i>Apium graveolens</i> var. <i>Dulce</i>	0	32	98-100	-0.5	31.1	VL	M	1-2 months	1-4%O ₂ + 3-5% CO ₂
Chard	<i>Beta vulgaris</i> var. <i>Cicla</i>	0	32	95-100			VL	H	10-14 days	
Chayote	<i>Sechium edule</i>	7	45	85-90					4-6 weeks	
Cherimoya; Custard apple	<i>Annona cherimola</i>	13	55	90-95	-2.2	28.0	H	H	2-4 weeks	3-5% O ₂ + 20-25% CO ₂
Cherries, sour	<i>Prunus cerasus</i>	0	32	90-95	-1.7	29.0			3-7 days	3-10% O ₂ + 10-12% CO ₂
Cherries, sweet	<i>Prunus avium</i>	-1 to 0	30-32	90-95	-2.1	28.2			2-3 weeks	10-20% O ₂ + 20-25% CO ₂
Chicory	see Endive									
Chiles	see Pepper									
Chinese broccoli; gailan	<i>Brassica alboglabra</i>	0	32	95-100			VL	H	10-14 days	
Chives	<i>Allium schoenoprasum</i>	0	32	95-100			VL	H	2-3 weeks	
Cilantro, Chinese parsley	<i>Coriandrum sativum</i>	0-2	32-34	95-100			VL	H	2 weeks	
Citrus										
--Calamondin orange	<i>Citrus reticulata</i> x <i>Fortunella</i> spp.	9-10	48-50	90	-2.0	28.3			2 weeks	
--Grapefruit	<i>Citrus paradisi</i>									3-10% O ₂ + 5-10% CO ₂
+CA, AZ, dry areas		14-15	58-60	85-90	-1.1	30.0	VL	M	6-8 weeks	
+FL, humid areas		10-15	50-60	85-90	-1.1	30.0	VL	M	6-8 weeks	
--Kumquat	<i>Fortunella japonica</i>	4	40	90-95					2-4 weeks	
--Lemon	<i>Citrus limon</i>	10-13	50-55	85-90	-1.4	29.4			1-6 months	5-10%O ₂ + 0-10% CO ₂ ; store at 32-40°F for 1 mo.
--Lime, Mexican, Tahiti or Persian	<i>Citrus aurantifolia</i> ; <i>C. latifolia</i>	9-10	48-50	85-90	-1.6	29.1			6-8 weeks	5-10% O ₂ + 0-10% CO ₂
--Orange	<i>Citrus sinensis</i>									5-10% O ₂ + 0-5% CO ₂
+CA, AZ, dry areas		3-9	38-48	85-90	-0.8	30.6	VL	M	3-8 weeks	
+FL; humid regions		0-2	32-36	85-90	-0.8	30.6	VL	M	8-12 weeks	
--Blood orange		4-7	40-44	90-95	-0.8	30.6			3-8 weeks	
--Seville; sour		10	50	85-90	-0.8	30.6	L	N	12 weeks	
--Pummelo	<i>Citrus grandis</i>	7-9	45-48	85-90	-1.6	29.1			12 weeks	
--Tangelo, Minneola		7-10	45-50	85-95	-0.9	30.3				
--Tangerine, Mandarin	<i>Citrus reticulata</i>	4-7	40-45	90-95	-1.1	30.1	VL	M	2-4 weeks	
Coconut	<i>Cocos nucifera</i>	0-2	32-36	89-85	-0.9	30.4			1-2 months	
Collards, Kale	<i>B. oleracea</i> var. <i>Acephala</i>	0	32	95-100	-0.5	31.1	VL	H	10-14 days	
Corn, sweet and baby	<i>Zea mays</i>	0	32	95-98	-0.6	30.9	VL	L	5-8 days	2-4%O ₂ + 5-10% CO ₂
Cucumber	<i>Cucumis sativus</i>	10-12	50-55	85-90	-0.5	31.1	L	H	10-14 days	3-5% O ₂ + 0-5% CO ₂
--pickling		4	40	95-100			L	H	7 days	3-5% O ₂ + 3-5% CO ₂
Currants	<i>Ribes sativum</i> ; <i>R. nigrum</i> ; <i>R. rubrum</i>	-0.5-0	31-32	90-95	-1.0	30.2	L	L	1-4 weeks	
Custard apple	see Cherimoya									

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		°C	°F		°C	°F				
Daikon; Oriental radish	<i>Raphanus sativus</i>	0-1	32-34	95-100			VL	L	4 months	
Dasheen	see Taro									
Date	<i>Phoenix dactylifera</i>	-18-0	0-32	75	-15.7	3.7	VL	L	6-12 months	
Dill	see Herbs									
Durian	<i>Durio zibethinus</i>	4-6	39-42	85-90					6-8 weeks	3-5% O ₂ + 5-15 CO ₂
Eggplant	<i>Solanum melongena</i>	10-12	50-54	90-95	-0.8	30.6	L	M	1-2 weeks	3-5% O ₂ + 0% CO ₂
Endive, Escarole	<i>Cichorium endivia</i>	0	32	95-100	-0.1	31.7	VL	M	2-4 weeks	
--Belgian endive; Witloof chicory	<i>Cichorium intybus</i>	2-3	36-38	95-98			VL	M	2-4 weeks	light causes greening; 3-4% O ₂ + 4-5% CO ₂
Feijoa, Pineapple guava	<i>Feijoa sellowiana</i>	5-10	41-50	90			M	L	2-3 weeks	
Fennel, see anise										
Fig, fresh	<i>Ficus carica</i>	-0.5-0	31-32	85-90	-2.4	27.6	M	L	7-10 days	5-10% O ₂ + 15-20% CO ₂
Garlic	<i>Allium sativum</i>	0	32	65-70	-0.8	30.5	VL	L	6-7 months	0.5% O ₂ + 5-10% CO ₂
Ginger	<i>Zingiber officinale</i>	13	55	65			VL	L	6 months	no CA benefit
Gooseberry	<i>Ribes grossularia</i>	-0.5-0	31-32	90-95	-1.1	30.0	L	L	3-4 weeks	
Granadilla	see Passionfruit									
Grape	<i>Vitis vinifera</i>	-0.5 - 0	31-32	90-95	-2.7	27.1	VL	L	2-8 weeks	2-5% O ₂ + 1-3% CO ₂ ; to 4 wks 5-10% O ₂ + 10-15 CO ₂
--American grape	<i>Vitis labrusca</i>	-1-0.5	30-31	90-95	-1.4	29.4	VL	L	2-8 weeks	
Grapefruit	see Citrus									
Guava	<i>Psidium guajava</i>	5-10	41-50	90			L	M	2-3 weeks	

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		°C	°F		°C	°F				
Herbs, fresh culinary	See specific herb									5-10% O ₂ + 4-10% CO ₂
--Basil	<i>Ocimum basilicum</i>	10	50	90			VL	H	7 days	
--Chives		0	32	95-100	-0.9	30.4	L	M		
--Cilantro, Chinese parsley	<i>Coriandrum sativum</i>	0-2	32-34	95-100			VL	H	2 weeks	3% O ₂ + 7-10% CO ₂ ; air + 7-10 CO ₂
--Dill	<i>Anethum graveolens</i>	0	32	95-100	-0.7	30.7	VL	H	1-2 weeks	
--Epazote	<i>Chenopodium ambrosioides</i>	0-5	32-41	90-95			VL	M	1-2 weeks	
--Mint	<i>Mentha spp.</i>	0	32	95-100			VL	H	2-3 weeks	
--Oregano	<i>Origanum vulgare</i>	0-5	32-41	90-95			VL	M	1-2 weeks	
--Parsley	<i>Petroselinum crispum</i>	0	32	95-100	-1.1	30.0	VL	H	1-2 months	
--Perilla, Shiso	<i>Perilla frutescens</i>	10	50	95			VL	M	7 days	
--Sage	<i>Salvia officinalis</i>	0	32	90-95					2-3 weeks	
--Thyme	<i>Thymus vulgaris</i>	0	32	90-95					2-3 weeks	
Horseradish	<i>Armoracia rusticana</i>	-1 a 0	30-32	98-100	-1.8	28.7	VL	L	10-12 mo.	
Husk Tomato	see tomatillo									
Jaboticaba	<i>Myrciaria cauliflora</i> = <i>Eugenia cauliflora</i>	13-15	55-60	90-95					2-3 days	
Jackfruit	<i>Artocarpus heterophyllus</i>	13	55	85-90			M	M	2-6 weeks	
Jerusalem artichoke	see Artichoke									

Jicama, Yambean	<i>Pachyrrhizus erosus</i>	13-18	55-65	85-90			VL	L	1-2 months	
Jujube; Chinese date	<i>Ziziphus jujuba</i>	2.5-10	36-50	85-90	-1.6	29.2	L	M	1 month	
Kaki	see Persimmon									
Kale	<i>oleracea var. acephala</i>	0	32	95-100	-0.5	31.1	VL	M		
Kiwano	see African horned melon	<>								
Kiwifruit; Chinese gooseberry	<i>Actinidia chinensis</i>	0	32	90-95	-0.9	30.4	L	H	3-5 months	1-2% O ₂ + 3-5% CO ₂
Kohlrabi	<i>B. oleracea var. Gongylodes</i>	0	32	98-100	-1.0	30.2	VL	L	2-3 months	no CA benefit

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		°C	°F		%	°C				
LoBok	see Daikon									
Langsat; lanzone	<i>Aglaia sp.;</i> <i>Lansium sp.</i>	11-14	52-58	85-90					2 weeks	
Leafy Greens										
--Cool season	various genera	0	32	95-100	-0.6	31.0	VL	H	10-14 days	
--Warm season	various genera	7-10	45-50	95-100	-0.6	31.0	VL	H	5-7 days	
Leek	<i>Allium porrum</i>	0	32	95-100	-0.7	30.7	VL	M	2 months	1-2% O ₂ + 2-5% CO ₂
Lemon	see Citrus									
Lettuce	<i>Lactuca sativa</i>	0	32	98-100	-0.2	31.7	VL	H	2-3 weeks	2-5% O ₂ + 0% CO ₂
Lime	see Citrus									
Longan	<i>Dimocarpus longan</i> = <i>Euphoria longan</i>	1-2	34-36	90-95	-2.4	27.7			3-5 weeks	
Loquat	<i>Eriobotrya japonica</i>	0	32	90	-1.9	28.6			3 weeks	
Luffa; Chinese okra	<i>Luffa spp.</i>	10-12	50-54	90-95			L	M	1-2 weeks	
Lychee, Litchi	<i>Litchi chinensis</i>	1-2	34-36	90-95			M	M	3-5 weeks	3-5% O ₂ + 3-5% CO ₂
Malanga, Tania, New cocoyam	<i>Xanthosoma sagittifolium</i>	7	45	70-80			VL	L	3 months	
Mamey	see Sapote									
Mandarin	see Citrus									
Mango	<i>Mangifera indica</i>	13	55	85-90	-1.4	29.5	M	M	2-3 weeks	3-5% O ₂ + 5-10% CO ₂
Mangosteen	<i>Garcinia mangostana</i>	13	55	85-90			M	H	2-4 weeks	
Melons										
--Cantaloupes and other netted melons	<i>Cucurbita melo var. reticulatus</i>	2-5	36-41	95	-1.2	29.9	H	M	2-3 weeks	3-5% O ₂ + 10-15% CO ₂
--Casaba,	<i>Cucurbita melo</i>	7-10	45-50	85-90	-1.0	30.3	L	L	3-4 weeks	3-5% O ₂ + 5-10% CO ₂
--Crenshaw	<i>Cucurbita melo</i>	7-10	45-50	85-90	-1.1	30.1	M	H	2-3 weeks	3-5% O ₂ + 5-10% CO ₂
--Honeydew, orange-flesh	<i>Cucurbita melo</i>	5-10	41-50	85-90	-1.1	30.1	M	H	3-4 weeks	3-5% O ₂ + 5-10% CO ₂
--Persian	<i>Cucurbita melo</i>	7-10	45-50	85-90	-0.8	30.6	M	H	2-3 weeks	3-5% O ₂ + 5-10% CO ₂
Mint	see herbs									
Mombin	see Spondias									
Mushrooms	<i>Agaricus</i> , other genera	0	32	90	-0.9	30.4	VL	M	7-14 days	3-21% O ₂ + 5-15% CO ₂
Mustard greens	<i>Brassica juncea</i>	0	32	90-95			VL	H	7-14 days	

Common name	Scientific name	Storage temperature	Relative humidity	Highest freezing temperature	Ethylene* production	Ethylene** sensitivity	Estimated shelf-life	Observations and Beneficial CA
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		°C	°F	%	ure					conditions
					°C	°F				
Nashi	see Asian pear									
Nectarine	<i>Prunus persica</i>	-0.5-0	31-32	90-95	-0.9	30.3	L	L	2-4 weeks	1-2% O ₂ + 3-5% CO ₂ ; internal breakdown 3-10°C
Okra	<i>Abelmoschus esculentus</i>	7-10	45-50	90-95	-1.8	28.7	L	M	7-10 days	air + 4-10% CO ₂
Olives, fresh	<i>Olea europea</i>	5-10	41-50	85-90	-1.4	29.4	L	M	4-6 weeks	2-3% O ₂ + 0-1% CO ₂
Onions	<i>Allium cepa</i>									
--Mature bulbs, dry		0	32	65-70	-0.8	30.6	VL	L	1-8 months	1-3% O ₂ + 5-10% CO ₂
--Green onions		0	32	95-100	-0.9	30.4	L	H	3 weeks	2-4% O ₂ + 10-20% CO ₂
Orange	see Citrus									
Papaya	<i>Carica papaya</i>	7-13	45-55	85-90		30.4	M	M	1-3 weeks	2-5% O ₂ + 5-8% CO ₂
Parsley	see Herbs									
Parsnips	<i>Pastinaca sativa</i>	0	32	95-100	-0.9	30.4	VL	H	4-6 months	ethylene causes bitterness
Passionfruit	<i>Passiflora spp.</i>	10	50	85-90			VH	M	3-4 weeks	
Peach	<i>Prunus persica</i>	-0.5-0	31-32	90-95	-0.9	30.3	L	L	2-4 weeks	Internal breakdown at 3-10°C; 1-2%O ₂ + 3-5%CO ₂
Pear, American	<i>Pyrus communis</i>	-1.5 to 0.5	29-31	90-95	-1.7	29.0	H	H	2-7 months	variation due to cultivar and maturity; 1-3% O ₂ + 0-5% CO ₂
Peas in pods; Snow, Snap & Sugar peas	<i>Pisum sativum</i>	0	32-33	90-98	-0.6	30.9	VL	M	1-2 weeks	2-3% O ₂ + 2-3% CO ₂
--Southern peas; cowpeas	<i>Vigna sinensis</i> = <i>V. unguiculata</i>	4-5	40-41	95					6-8 days	
Pepino; melon pear	<i>Solanum muricatum</i>	5-10	41-50	95			L	M	4 weeks	
Peppers										
--Bell Pepper, paprika	<i>Capsicum annuum</i>	7-10	45-50	95-98	-0.7	30.7	L	L	2-3 weeks	2-5% O ₂ + 2-5% CO ₂
--Hot peppers, Chiles	<i>Capsicum annuum</i> and <i>C. frutescens</i>	5-10	41-50	85-95	-0.7	30.7	L	M	2-3 weeks	3-5% O ₂ + 5-10% CO ₂
Persimmon; Kaki	<i>Dispyros kaki</i>									3-5% O ₂ + 5-8% CO ₂
--Fuyu		10	50	90-95	-2.2	28.1	L	H	1-3 months	
--Hachiya		5	41	90-95	-2.2	28.1	L	H	2-3 months	
Pineapple	<i>Ananas comosus</i>	7-13	45-55	85-90	-1.1	30.0	L	L	2-4 weeks	2-5% O ₂ + 5-10% CO ₂
Plantain	<i>Musa paradisiaca</i> var. <i>paradisiaca</i>	13-15	56-59	90-95	-0.8	30.6	L	H	1-5 weeks	
Plums and Prunes	<i>Prunus domestica</i>	-0.5-0	31-32	90-95	-0.8	30.5	L	L	2-5 weeks	1-2% O ₂ + 0-5% CO ₂
Pomegranate	<i>Punica granatum</i>	5	41	90-95	-3.0	26.6			2-3 months	
Potato	<i>Solanum tuberosum</i>									no CA benefit
--early crop		10-15	50-59	90-95	-0.8	30.5	VL	M	10-14 days	
--late crop		4-12	40-54	95-98	-0.8	30.5	VL	M	5-10 months	
Pumpkin	<i>Cucurbita maxima</i>	12-15	54-59	50-70	-0.8	30.5	L	M	2-3 months	

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**Ethylene sensitivity (detrimental effects include yellowing, softening, increased decay, loss of leaves, browning)
L = low sensitivity
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		°C	°F		°C	°F				
Quince	<i>Cydonia oblonga</i>	-0.5-0	31-32	90	-2.0	28.4	L	H	2-3 months	
Raddichio	<i>Cichorium intybus</i>	0-1	32-34	95-100					3-4 weeks	
Radish	<i>Raphanus sativus</i>	0	32	95-100	-0.7	30.7	VL	L	1-2 months	1-2% O ₂ + 2-3% CO ₂
Rambutan	<i>Nephelium lappaceum</i>	12	54	90-95			H	H	1-3 weeks	
Rhubarb	<i>Rheum rhaponticum</i>	0	32	95-100	-0.9	30.3	VL	L	2-4 weeks	
Rutabaga	<i>B. napus var. Napobrassica</i>	0	32	98-100	-1.1	30.1	VL	L	4-6 months	
Sage	see Herbs									
Salsify; Vegetable oyster	<i>Trapopogon porrifolius</i>	0	32	95-98	-1.1	30.1	VL	L	2-4 months	
Sapotes										
--Caimito, star apple	<i>Chrysophyllum cainito</i>	3	38	90	-1.2	29.9			3 weeks	
--Canistel, Eggfruit	<i>Pouteria campechiana</i>	13-15	55-60	85-90	-1.8	28.7			3 weeks	
--Black sapote	<i>Diospyros ebenaster</i>	13-15	55-59	85-90	-2.3	27.8			2-3 weeks	
--White sapote	<i>Casimiroa edulis</i>	20	68	85-90	-2.0	28.4			2-3 weeks	
--Mamey sapote	<i>Calocarpum mammosum</i>	13-15	55-60	90-95			H	H	2-3 weeks	
--Sapodilla, chicosapote	<i>Achras sapota</i>	15-20	59-68	85-90			H	H	2 weeks	
Scorzoneria	see Black Salsify									
Shallot bulbs	<i>Allium cepa var. ascalonicum</i>	0-2.5	32-36	65-70	-0.7	30.7	L	L		
Soursop	<i>Annona muricata</i>	13	55	85-90					1-2 weeks	
Spinach	<i>Spinacia oleracea</i>	0	32	95-100	-0.3	31.5	VL	H	10-14 days	5-10% O ₂ + 5-10% CO ₂
Spondias, Mombin, Wi apple, Jobo, Hogplum	<i>Spondias spp.</i>	13	55	85-90					1-2 weeks	
Sprouts from seeds	various genera	0	32	95-100					5-9 days	
--Alfalfa sprouts	<i>Medicago sativa</i>	0	32	95-100					7 days	
--Bean sprouts	<i>Phaseolus sp.</i>	0	32	95-100					7-9 days	
--Radish sprouts	<i>Raphaus sp.</i>	0	32	95-100					5-7	
Squash										
--summer (soft rind); courgette	<i>Cucurbita pepo</i>	7-10	45-50	95	-0.5	31.1	L	M	1-2 weeks	3-5% O ₂ + 5-10% CO ₂
--winter (hard rind); calabash	<i>Cucurbita moschata; C. maxima</i>	12-15	54-59	50-70	-0.8	30.5	L	M	2-3 months	large differences among varieties
Star-apple	see Sapotes									
Starfruit	see Carambola									
Sugar apple; Custard apple	<i>Annona squamosa; Annona spp.</i>	7	45	85-90			H	H	4 weeks	
Sweetpotato, "yam"	<i>Ipomea batatas</i>	13-15	55-60	85-95	-1.3	29.7	VL	L	4-7 months	

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		°C	°F	ty %	e °C	°F				
Tamarillo, Tree tomato	<i>Cyphomandra betacea</i>	3-4	37-40	85-95			L	M	10 weeks	
Tamarind	<i>Tamarindus indica</i>	2-7	36-45	90-95	-3.7	25.4	VL	VL	3-4 weeks	
Taro, Cocoyam, Eddoe, Dasheen	<i>Colocasia esculenta</i>	7-10	45-50	85-90	-0.9	30.3			4 months	no CA benefit
Thyme	see Herbs									
Tomatillo; Husk tomato	<i>Physalis ixocarpa</i>	7-13	45-55	85-90			VL	M	3 weeks	
Tomato	<i>Lycopersicon esculentum</i>									
--mature-green		10-13	50-55	90-95	-0.5	31.0	VL	H	1-3 weeks	3-5% O ₂ + 2-3% CO ₂
--firm-ripe		8-10	46-50	85-90	-0.5	31.1	H	L		3-5% O ₂ + 3-5% CO ₂
Turnip root	<i>Brassica campestris var. Rapifera</i>	0	32	95	-1.0	30.1	VL	L	4-5 months	
Water Chestnuts	<i>Eleocharis dulcis</i>	1-2	32-36	85-90					2-4 months	
Watercress; garden cress	<i>Lepidium sativum; Nasturtium officinales</i>	0	32	95-100	-0.3	31.5	VL	H	2-3 weeks	
Watermelon	<i>Citrullus vulgaris</i>	10-15	50-60	90	-0.4	30.9	VL	H	2-3 weeks	no CA benefit
Yam	<i>Dioscorea spp.</i>	15	59	70-80	-1.1	30.0	VL	L	2-7 months	
Yucca	see Cassava									

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