



2026 Controlled Atmosphere Storage Guidelines for Common Ontario Apples

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Table 1. Oxygen, carbon dioxide, temperature and important notes for storage of common Ontario apple cultivars.

Cultivar	O ₂ (%)	CO ₂ (%)	Temperature (°C)	Important Notes
Ambrosia	1.2 – 1.5	1 – 1.2	0.5 – 1	- Slow cooling or conditioning necessary with 1-MCP <1% O₂ possible with fruit monitoring (via DCA, etc.)
Cortland	1.5 – 2.5	1.5 – 2	0.5 – 2	- Higher temp with 1-MCP - Sensitive to CO₂
Crispin / Mutsu	1.5 – 2.5	1.5 – 2.5	0 – 0.5	--
Delicious (Red)	1 – 2	1 – 2	0 – 0.5	<1% O₂ possible with fruit monitoring
Empire	1.5 – 2	1 – 1.5	2	- Extremely sensitive to CO₂ - Keep CO₂ <0.5% for 1st month if not treated with DPA
Fuji	1 – 2	0.5 – 1	0 – 1	- Sensitive to CO₂ - Delay CA 5-6 weeks with 1-MCP
Gala	1 – 1.2	0.5 – 1	0.5 – 2	- Higher temp with 1-MCP - Extreme regional differences <1% O₂ possible with fruit monitoring, very tolerant to low O₂
Golden Delicious	1 – 2	1 – 2	0 – 1	- Slow stepwise cooling with 1-MCP <1% O₂ possible with fruit monitoring
Granny Smith	1.5 – 2	0.5 – 2	0 – 1	<1% O₂ possible with fruit monitoring
Honeycrisp	2 – 3	1 – 3	3 (after conditioning at 10°C for 5-7 days)	- Delay CA for 1st month if not treated with DPA - Extremely sensitive to CO₂
Idared	1.5 – 2.5	1.5 – 2.5	0 – 1	--
Jonagold	1.5 – 2.5	1.5 – 2	0 – 1	Higher temp with 1-MCP
McIntosh	2.5	2 for 1 st month, then 4.5	3	Sensitive to CO₂ with 1-MCP
Northern Spy	1.5 – 2.5	1.5 – 2	0 – 0.5	Sensitive to CO₂
Spartan	2 – 3	2 – 2.5	0.5 – 1	--

Updated and adapted in part from:

DeEll, J.R. 2020. Pome fruits: Apple quality and storage, p. 293-298. In: M.I. Gil and R. Beaudry (eds). Controlled and Modified Atmosphere for Fresh and Fresh-cut Produce. Elsevier Academic Press, United Kingdom.