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# INFLUENCE OF STORAGE TECHNOLOGIES ON QUALITY PARAMETERS FOR APPLE'S GROWTH IN ORGANIC SYSTEM



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## INTRODUCTION

Nowadays, the consumer demand for organic fresh fruits with better nutritional quality has increased, therefore the market pressure for a prolonged shelf life is growing. For this reason, improving storage conditions and technologies is important and becomes highly relevant. The purpose of this study was to minimize the influence of storage technologies on quality parameters for apples like Gemini cv. and Renoir cv. growth in organic system.

## **MATERIALS AND METHODS**

**Samples:** Two apple varieties like Gemini and Renoir were harvested, at the optimal ripening stage in the beginning of October 2018, stored and monitored for seven months.

**Storage:** Was performed through normal atmosphere, with 1°C and 95% relative humidity (RH) for 2 months, combined with controlled atmosphere storage for another 5 months with 1°C, 95% RH, 3%  $O_2$  and two different  $CO_2$  concentrations (5%, respectively 10%).

**Analyses:** firmness, pH value, total titratable acid (TAA), total soluble solids (TSS), dry matter (DM), ascorbic acid and total anthocyanin content.

**Moments of analyses:** 0 - after harvesting, 2 - after 2 months of storage in normal atmosphere, 5 - after 2 months of storage in normal atmosphere and 3 months of controlled atmosphere storage, 6 - after 2 months of storage in normal atmosphere and 4 months of controlled atmosphere storage, 7 - after 2 months of storage in normal atmosphere and 5 months of controlled atmosphere storage













Ascorbic acid













Variety	Months	Storage condition	рН	TAA (mg malic acid/100 g FW)	TSS %	DM %	Firmness kg/cm <sup>2</sup>	Caliber	Variety	Months	Storage condition	рН	TAA (mg malic acid/100 g FW)	TSS %	DM %	Firmness kg/cm <sup>2</sup>	Caliber
Gemini	0	<b>Fresh apples</b>	3,71 ±0,15	$0,18\pm 0,02$	12,17±0,97	1,38 ±0,57	4,97 ±0,41	68 ±2,73	Renoir	0	<b>Fresh apples</b>	3,60 ±0,09	$0,24 \pm 0,005$	$16,5\pm 0,5$	$18,48\pm0,58$	6,47±0,6	63 ±2,74
	2	0% CO <sub>2</sub>	3,52 ±0,05	0,16 ±0,01	12,3 ±0,41	18,44 ±4,82	2,38 ±0,11	65±5		2	0% CO <sub>2</sub>	3,46 ±0,18	0,24±0,03	16,87±0,72	21,38±0,33	2,64 ±0,23	64 ±2,23
	5	5% CO <sub>2</sub> 10% CO <sub>2</sub>	3,77 ±0,11 3,75 ±0,06	0,21 ±0,02 0,21 ±0,002	10,48±0,54 10,18±0,9	17,89 ±0,4 14,8 ±0,28	3,98 ±0,3 4,45 ±0,49	73 ±2,73 66 ±2,24		5	5% CO <sub>2</sub> 10% CO <sub>2</sub>	3,80 ±0,07 3,73 ±0,09	0,26 ±0,001 0,28 ±0,002	14,86±1,07 15,26±0,8	22,37±0,66 21,75±0,14	4,17 ±0,42 4,66 ±0,55	61 ±4,18 65 ±3,53
	6	5% CO <sub>2</sub> 10% CO <sub>2</sub>	4,05±0,15 3,97±0,03	$0,18 \pm 0,009$ $0,18 \pm 0,003$	11,24±0,55 11,36±0,79	<b>13,94±0,37</b> 15,08±0,86	3,8±0,83 4,27±0,23	66 ±2,24 66 ±4,18		6	5% CO <sub>2</sub> 10% CO <sub>2</sub>	4,04 ±0,01 4 ±0,03	0,19 ±0,003 0,23 ±0,009	<b>17,38±1,6</b> 17,42±0,69	$22,73\pm0,71$ $23,31\pm0,34$	4,73 ±1,01 4,62 ±0,56	61 ±2,24 65 ±3,53
	7	5% CO <sub>2</sub> 10% CO <sub>2</sub>	3,68 ±0,05 3,7 ±0,06	0,18±0,014 0,18±0,009	11,36±0,38 11,24±11,24	<b>15,06±0,23</b> 14,55±0,07	4,37 ±0,51 4,73 ±0,4	61 ±2,24 61 ±2,24		7	5% CO <sub>2</sub> 10% CO <sub>2</sub>	3,69 ±0,06 3,76 ±0,02	0,25±0,008 0,2±0,002	18,66±1,38 17,88±0,69	24,01 ±0,37 23,3 ±0,05	5,24 ±1,73 4,32 ±0,72	65 ±3,53 64 ±2,24

### CONCLUSIONS

• Gemini variety registered good results in the given experimental conditions, with an increase in anthocyanin content and maintaining the other qualitative parameters at the level of those recorded at 2 months of cold storage.

After six months of combined storage conditions the ascorbic acid content registered decreases for both analyzed varieties, moreover in the seven month this was under identification and quantification limits.
Further studies and trials are required in order to find new postharvest conditions that could decrease the total costs of storage.

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