

Table 1: Effect of some modified atmosphere (MA) treatments and cold storage periods on chilling injury index (CII) and fruit decay % (FD %) of Balady lime fruits after cold storage periods (2010 and 2011 seasons).

Storage period (days)	Chilling injury index [♦]					Fruit decay %				
	30	60	90	105	Mean	30	60	90	105	Mean
MA treatments	<i>1st Season</i>									
Packing in plastic nets (Control)	2.87fg	4.17cd	5.00b	7.17a	4.80A	0.00i	19.5f	35.4e	41.9d	24.2C
Passive MA without additions	0.00i	3.20ef	4.40bc	7.57a	3.79B	0.00i	23.5f	40.3de	100.0a	40.9B
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	0.00i	2.03h	2.33gh	3.07f	1.86C	7.50h	12.8g	24.1f	40.3de	21.2C
Active MA 10% O ₂ + 3% CO ₂	0.14i	3.73de	4.57bc	7.00a	3.86B	4.00hi	20.3f	52.1c	100.0a	44.1A
Active MA 10% O ₂ + 6% CO ₂	0.16i	3.97cd	4.90b	7.33a	4.09B	5.27hi	23.5f	57.2b	100.0a	46.5A
Mean	0.63D	3.42C	4.24B	6.43A	-	3.35D	19.9C	41.8B	76.4A	-
	<i>2nd Season</i>									
Packing in plastic nets (Control)	1.77h	4.30d	5.57c	7.03b	4.67A	0.00h	3.57h	25.e	41.0d	17.6E
Passive MA without additions	0.00i	3.57ef	4.33d	7.80a	3.93B	0.00h	22.5ef	37.8d	100.0a	40.1C
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	0.00i	1.73h	2.23h	3.00g	1.74D	3.87h	14.7g	22.9ef	41.1d	20.6D
Active MA 10% O ₂ + 3% CO ₂	0.35i	3.27fg	4.10de	6.50b	3.55C	1.67h	22.1ef	50.0c	100.0a	43.4B
Active MA 10% O ₂ + 6% CO ₂	0.03i	3.60ef	4.10de	6.83b	3.64C	3.87h	18.9f	61.0b	100.0a	45.9A
Mean	0.43D	3.29C	4.07B	6.23A	-	1.88D	16.3C	39.5B	76.4A	-

Means within each column followed by the same letter (s) are not significantly different at 5% level.

♦ Chilling injury index (0=without decay; 2=spot decay; 4=25-50% decay; 8=>50 % decay).

Fruits of MA treatments, except of control treatment, were packed in carton boxes at rate of 190±10 g fruits / liter.

Table 2: Effect of some modified atmosphere (MA) treatments and cold storage periods on chilling injury index (CII) and fruit decay (FD) percentage of Balady lime fruits after shelf life period (2010 and 2011 seasons).

Storage period (days) \ MA treatment	Chilling Injury Index [♦]				Fruit decay %			
	30	60	90	Mean	30	60	90	Mean
<i>1st Season</i>								
Packing in plastic nets (Control)	0.00j	3.63fg	5.97b	3.20B	0.00g	0.00g	0.00g	0.00D
Passive MA without additions	0.00j	3.40gh	5.17c	2.86C	6.70f	54.60b	65.67a	42.3A
Passive MA with adding 25g wetted Ca (OH) 2 per sealed package.	0.00j	2.43i	4.50de	2.31D	9.80ef	17.73d	62.47a	30.0B
Active MA 10% O2 + 3% CO2	0.00j	4.10ef	6.97a	3.69A	8.83ef	19.67d	64.93a	31.1B
Active MA 10% O2 + 6% CO2	0.00j	2.97h	4.93cd	2.63C	8.86ef	13.20e	34.03c	18.7C
Mean	0.00C	3.31B	5.51A	-	6.84C	21.04B	45.42A	-
<i>2nd Season</i>								
Packing in plastic nets (Control)	0.00h	3.57f	6.87a	3.48A	0.00h	0.00h	0.00h	0.00D
Passive MA without additions	0.00h	3.43f	5.20c	2.88B	5.23g	46.63c	55.43b	35.8A
Passive MA with adding 25g wetted Ca (OH) 2 per sealed package.	0.00h	2.53g	4.53d	2.36C	7.63g	22.87e	57.23b	29.2B
Active MA 10% O2 + 3% CO2	0.00h	4.20de	5.83b	3.34A	7.10g	16.63f	62.07a	28.6B
Active MA 10% O2 + 6% CO2	0.00h	3.20f	4.00e	2.40C	6.50g	23.00e	41.37d	23.6C
Mean	0.00C	3.39B	5.29A	-	5.29C	21.83B	43.22A	-

Means within each column followed by the same letter (s) are not significantly different at 5% level.

♦Chilling injury index (0=without decay; 2=spot decay; 4=25-50% decay; 8=>50 % decay).

Fruits of MA treatments, except of control treatment, were packed in sealed carton boxes at rate of 190±10 g fruits / liter.

Table 3: Effect of some modified atmosphere (MA) treatments and cold storage periods on fruit weight loss % (FWL), peel color index (PCI) and pulp firmness (PF) of Balady lime fruits after cold storage periods (2010 and 2011 seasons).

Storage period (days)	Fruit weight loss %				Peel color index*				Pulp firmness (kg/cm ²)			
	30	60	90	Mean	30	60	90	Mean	30	60	90	Mean
MA treatment	<i>1st Season</i>											
Packing in plastic nets (Control)	18.6b	38.0a	36.3a	30.9A	2.33fg	2.60ef	3.33cd	2.76D	1.36a	1.55a	1.63a	1.51A
Passive MA without additions	2.33h	8.53g	7.87g	6.24C	2.63e	3.43bc	4.00a	3.36A	.763bcd	.977b	.887bc	0.88B
Passive MA with adding 25g wetted Ca(OH) ₂ per sealed package.	2.43h	8.53g	9.53fg	6.83C	2.63e	3.40c	3.70b	3.24A	.673cde	.613cde	.563de	0.62CD
Active MA 10% O ₂ + 3% CO ₂	2.47h	13.5de	16.5bc	10.8B	2.23g	3.07d	3.47bc	2.92C	.567de	.460de	.447e	0.49D
Active MA 10% O ₂ + 6% CO ₂	2.47h	11.5ef	15.5cd	9.84B	2.33fg	3.33cd	3.57bc	3.08B	1.03b	.650cde	.613cde	0.77BC
Mean	5.67C	16.0B	17.1A	-	2.43C	3.17B	3.61A	-	.880A	.851A	.827A	-
	<i>2nd Season</i>											
Packing in plastic nets (Control)	20.8b	41.3a	40.3a	34.1A	2.53d	2.53d	3.60abc	2.89B	1.18c	1.47b	1.70a	1.45A
Passive MA without additions	2.10h	7.93g	9.80fg	6.61C	2.57d	3.50bc	4.00a	3.36A	.860de	.927d	.842de	0.88B
Passive MA with adding 25g wetted Ca(OH) ₂ per sealed package.	2.60h	8.80g	9.80fg	7.07C	2.30d	3.50bc	3.83ab	3.21A	.673f	.510f	.490f	0.56D
Active MA 10% O ₂ + 3% CO ₂	3.03h	11.4ef	15.3c	9.90B	2.57d	3.27c	3.57bc	3.13A	.540f	.447f	.470f	0.49E
Active MA 10% O ₂ + 6% CO ₂	2.63h	13.1de	14.7cd	10.1B	2.43d	3.53bc	3.77a0b	3.24A	.907d	.757ef	.690f	0.78C
Mean	6.23C	16.5B	18.0A	-	2.48C	3.27B	3.75A	-	.831A	.821A	.839A	-

Means within each column followed by the same letter (s) are not significantly different at 5% level.

* 1 = 100 % green; 2 = < 25 % yellow; 3 = 26-50 % yellow and 4 = > 50 % yellow.

Fruits of MA treatments, except of control treatment, were packed in sealed carton boxes at rate of 190±10 g fruits / liter.

Table 4 : Effect of some modified atmosphere (MA) treatments and cold storage periods on fruit weight loss % (FWL), peel color index (PCI) and pulp firmness (PF) of Balady lime fruits after shelf life period (2010 and 2011 seasons).

Storage period (days)	Fruit weight loss				Peel color				Pulp firmness			
	30	60	90	Mean	30	60	90	Mean	30	60	90	Mean
MA treatment	<i>1st Season</i>											
Packing in plastic nets (Control)	18.1d	13.3ef	16.0de	15.8C	2.73e	3.17d	3.43c	3.11C	1.03bcd	.930de	1.00cd	.988A
Passive MA without additions	13.1ef	15.1e	29.9b	19.4B	3.00de	3.93a	4.00a	3.64A	1.06bc	.923de	.857ef	.947AB
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	11.4fg	9.90g	38.9a	20.1B	2.33f	3.77ab	4.00a	3.37B	1.09abc	.843ef	.840ef	.926AB
Active MA 10% O ₂ + 3% CO ₂	10.6fg	22.8c	40.4a	24.6A	2.37f	3.63bc	4.00a	3.33B	1.19a	.877ef	.867ef	.977A
Active MA 10% O ₂ + 6% CO ₂	6.80h	25.3c	29.4b	20.5B	2.73e	3.87ab	4.00a	3.53A	1.13ab	.760f	.763f	.886B
Mean	12.0C	17.3B	30.9A	-	2.63C	3.67B	3.89A	-	1.10A	.867B	.865B	-
	<i>2nd Season</i>											
Packing in plastic nets (Control)	19.7de	12.8gh	18.1ef	16.9C	2.80ef	2.97e	3.43d	3.07C	1.02a	.857a	.850a	.908B
Passive MA without additions	14.7fg	19.1e	31.8b	21.9AB	2.77ef	3.93ab	4.00a	3.57A	1.14a	.983a	.857a	.994A
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	9.13ij	12.1ghi	39.8a	20.3B	2.63fg	3.67bcd	3.93ab	3.41AB	1.20a	.923a	.903a	1.01A
Active MA 10% O ₂ + 3% CO ₂	10.1hi	22.9cd	37.9a	23.6A	2.43g	3.60cd	4.00a	3.34B	1.19a	1.10a	.933a	1.07A
Active MA 10% O ₂ + 6% CO ₂	6.03j	23.9c	34.0b	21.3B	2.47g	3.83abc	4.00a	3.43AB	1.20a	.920a	.893a	1.01A
Mean	11.9C	18.2B	32.3A	-	2.62C	3.60B	3.87A	-	1.15A	.957B	.887C	-

Means within each column followed by the same letter (s) are not significantly different at 5% level.

* 1 = 100 % green; 2 = < 25 % yellow; 3 = 26-50 % yellow and 4 = > 50 % yellow.

Fruits of MA treatments, except of control treatment, were packed in sealed carton boxes at rate of 190±10 g fruits / liter.

Table 5: Effect of some modified atmosphere (MA) treatments and cold storage periods on juice and TSS percentages as well as vitamin C content of Balady lime fruits after cold storage periods (2010 and 2011 seasons).

Storage period (days)	Juice %				TSS %				Vit. C (mg/ 100 cm ³ juice)			
	30	60	90	Mean	30	60	90	Mean	30	60	90	Mean
MA treatment	<i>1st Season</i>											
Packing in plastic nets (Control)	33.4bc	31.9cd	38.3a	34.5A	9.10cd	10.4a	10.6a	10.0A	55.0ab	36.8c	35.5c	42.4A
Passive MA without additions	25.5gh	26.4fg	28.6ef	26.8C	9.23c	9.33c	9.47bc	9.34B	37.0c	44.8abc	41.5bc	41.1A
Passive MA with adding 25g wetted Ca (OH) 2 per sealed package.	29.9de	28.2ef	35.5b	31.2B	9.13cd	9.10cd	9.43bc	9.22B	56.1ab	38.0c	30.8c	41.6A
Active MA 10% O ₂ + 3% CO ₂	23.9h	21.6i	27.7efg	24.4D	9.23c	9.27c	9.73b	9.41B	57.8a	45.3abc	32.0c	45.0A
Active MA 10% O ₂ + 6% CO ₂	28.6ef	33.5bc	38.4a	33.5A	8.77de	8.63e	8.83de	8.74C	57.2a	41.4bc	33.0c	43.9A
Mean	28.2B	28.3B	33.7A	-	9.09C	9.35B	9.61A	-	52.6A	41.3B	34.6C	-
	<i>2nd Season</i>											
Packing in plastic nets (Control)	37.0c	32.7e	41.0a	36.9A	8.97e	10.1b	10.8a	9.96A	57.2a	38.7b-e	35.0def	43.6A
Passive MA without additions	27.3hi	27.0i	28.6gh	27.6C	9.27cde	9.50c	10.3b	9.68B	56.1a	41.4bc	40.5bcd	46.0A
Passive MA with adding 25g wetted Ca (OH) 2 per sealed package.	30.8f	29.4fg	34.4d	31.5B	9.13de	9.23cde	9.53c	9.30C	53.3a	43.2bc	37.5cde	44.7A
Active MA 10% O ₂ + 3% CO ₂	24.6j	22.0k	30.4f	25.7D	9.23cde	9.07e	9.53c	9.28C	55.0a	43.0bc	34.0ef	44.0A
Active MA 10% O ₂ + 6% CO ₂	29.8fg	39.0b	40.5a	36.4A	9.03e	9.00e	9.47cd	9.17C	58.9a	43.9bc	31.0f	44.6A
Mean	29.9B	30.0B	35.0A	-	9.13C	9.37B	9.93A	-	56.1A	42.0B	35.6C	-

Means within each column followed by the same letter (s) are not significantly different at 5% level.

Fruits of all MA treatments , except of control treatment, were packed in sealed carton boxes at rate of 190±10 g fruits / liter.

Table 6: Effect of some modified atmosphere (MA) treatments and cold storage periods on juice and TSS percentages as well as vitamin C content of Balady lime fruits after shelf life period (2010 and 2011 seasons).

Storage period (days)	Juice%				TSS%				Vit. C (mg/ 100 cm ³ juice)			
	30	60	90	Mean	30	60	90	Mean	30	60	90	Mean
MA treatment	<i>1st Season</i>											
Packing in plastic nets (Control)	28.4h	29.4gh	37.0bc	31.6D	10.2b	10.1b	10.8a	10.4A	39.7a	35.8a	34.2a	36.6A
Passive MA without additions	36.9bcd	37.5b	46.5a	40.3A	9.23c	9.10c	9.10c	9.14B	35.6a	33.1a	31.6a	33.4BC
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	36.3bcd	35.3def	35.5def	35.7B	9.13c	9.03c	9.10c	9.09B	36.2a	33.7a	32.5a	34.1B
Active MA 10% O ₂ + 3% CO ₂	32.2f	30.8fg	35.3def	32.8C	8.90cd	9.17c	8.87cd	8.98B	35.4a	31.1a	28.5a	31.7C
Active MA 10% O ₂ + 6% CO ₂	35.4def	34.1e	35.1de	34.9B	8.60d	9.13c	9.03c	8.92B	23.3a	21.9a	21.0a	22.1D
Mean	33.9B	33.4B	37.9A	-	9.21A	9.31A	9.37A	-	34.0A	31.1B	29.6B	-
	<i>2nd Season</i>											
Packing in plastic nets (Control)	29.9f	30.5f	33.9cde	31.4D	9.73b	9.47b	10.9a	10.0A	36.7a	35.7a	32.5a	35.0A
Passive MA without additions	37.0b	37.0b	47.8a	40.6A	9.07c	8.90c	9.13c	9.03B	38.5a	36.8a	32.9a	36.1A
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	33.4cde	31.9def	36.9b	34.1C	9.03c	8.90c	8.93c	8.96B	37.9a	34.9a	32.5a	35.1A
Active MA 10% O ₂ + 3% CO ₂	33.1cde	31.6ef	34.4cd	33.0C	9.07c	8.93c	9.07c	9.02B	35.0a	28.8a	28.3a	30.7B
Active MA 10% O ₂ + 6% CO ₂	37.0b	35.3bc	37.7b	36.7B	8.90c	8.93c	9.07c	8.97B	26.3a	25.4a	25.0a	25.6C
Mean	34.1B	33.3B	38.1A	-	9.16B	9.03B	9.43A	-	34.9A	32.3B	30.2C	-

Means within each column followed by the same letter (s) are not significantly different at 5% level.

Fruits of all MA treatments , except of control treatment, were packed in sealed carton boxes at rate of 190±10 g fruits / liter.

Table 7: Effect of some modified atmosphere (MA) treatments and cold storage periods on acidity (%), technological index (TI) and TSS/ acid Ratio of Balady lime fruits after cold storage periods (2010 and 2011 seasons).

Storage period (days)	Acidity (%)				Technological index(TI)				TSS/Acid ratio			
	30	60	90	Mean	30	60	90	Mean	30	60	90	Mean
MA treatment	<i>1st Season</i>											
Packing in plastic nets (Control)	7.67a	7.73a	7.80a	7.73A	3.04c	3.32b	4.06a	3.47A	1.19i	1.35e-h	1.36e-h	1.30C
Passive MA without additions	7.15b	6.63cd	5.63g	6.47B	2.36gh	2.46fg	2.71def	2.51C	1.29ghi	1.41def	1.68a	1.46A
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	7.18b	5.90fg	5.93efg	6.34B	2.73de	2.57efg	3.35b	2.88B	1.27ghi	1.55bc	1.59ab	1.47A
Active MA 10% O ₂ + 3% CO ₂	6.93bc	6.40de	5.80fg	6.38B	2.20hi	2.00i	2.69def	2.30D	1.33fgh	1.45cde	1.68a	1.49A
Active MA 10% O ₂ + 6% CO ₂	6.97bc	6.27def	5.90fg	6.38B	2.51efg	2.89cd	3.39b	2.93B	1.26hi	1.38efg	1.50bcd	1.39B
Mean	7.18A	6.59B	6.12C	-	2.57B	2.65B	3.24A	-	1.27C	1.42B	1.56A	-
	<i>2nd Season</i>											
Packing in plastic nets (Control)	7.67ab	7.83a	7.30bc	7.60A	3.32d	3.29d	4.44a	3.68A	1.17a	1.29a	1.48a	1.31B
Passive MA without additions	7.13c	6.37d	6.33d	6.61B	2.53h	2.57gh	2.93e	2.68D	1.30a	1.50a	1.62a	1.47A
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	7.33bc	6.27d	6.00de	6.53BC	2.81ef	2.71f	3.28d	2.93C	1.25a	1.47a	1.59a	1.44A
Active MA 10% O ₂ + 3% CO ₂	7.17c	6.23d	5.63e	6.34C	2.27i	1.99j	2.90e	2.39E	1.29a	1.45a	1.69a	1.48A
Active MA 10% O ₂ + 6% CO ₂	6.97c	6.30d	5.97de	6.41BC	2.69fg	3.51c	3.83b	3.34B	1.30a	1.43a	1.59a	1.44A
Mean	7.25A	6.60B	6.25C	-	2.72C	2.82B	3.48A	-	1.26C	1.43B	1.60A	-

Means within each column followed by the same letter (s) are not significantly different at 5% level.

Fruits of MA treatments, except of control treatment, were packed in sealed carton boxes at rate of 190±10 g fruits / liter.

Table 8: Effect of some modified atmosphere (MA) treatments and cold storage periods on acidity (%), technological index (TI) and TSS/ acid Ratio of Balady lime fruits after shelf life period (2010 and 2011 seasons).

Storage period (days)	Acidity (%)				Technological index(TI)				TSS/Acid ratio			
	30	60	90	Mean	30	60	90	Mean	30	60	90	Mean
MA treatment	<i>1st Season</i>											
Packing in plastic nets (Control)	8.57a	7.37cd	7.57bc	7.83A	2.89gh	2.97fgh	3.99b	3.28B	1.19fg	1.37bcd	1.43bc	1.33A
Passive MA without additions	7.87b	7.07de	7.37cd	7.43B	3.41c	3.41c	4.23a	3.68A	1.17g	1.29def	1.24efg	1.23B
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	7.60bc	6.80ef	5.83h	6.74C	3.32cd	3.18c-f	3.23cde	3.25B	1.20fg	1.33cde	1.56a	1.36A
Active MA 10% O ₂ + 3% CO ₂	6.63efg	6.53fg	6.33fg	6.50C	2.87h	2.83h	3.13d-g	2.94D	1.34cd	1.40bc	1.40bc	1.38A
Active MA 10% O ₂ + 6% CO ₂	6.73ef	6.50fg	6.23gh	6.49C	3.05e-h	3.12d-g	3.17c-f	3.11C	1.28def	1.40bc	1.45b	1.38A
Mean	7.48A	6.85B	6.67B	-	3.11B	3.10B	3.55A	-	1.24C	1.36B	1.41A	-
	<i>2nd Season</i>											
Packing in plastic nets (Control)	8.30a	7.37cd	7.57c	7.74A	2.92ef	2.89ef	3.71b	3.17BC	1.17hi	1.28efg	1.44abcc	1.30B
Passive MA without additions	8.00ab	7.03de	7.38cd	7.47B	3.35c	3.29cd	4.37a	3.67A	1.13i	1.27fg	1.24gh	1.21C
Passive MA with adding 25g wetted Ca (OH) ₂ per sealed package.	7.67bc	7.03de	5.83h	6.84C	3.02def	2.84ef	3.30cd	3.05CD	1.18hi	1.27fg	1.53a	1.33B
Active MA 10% O ₂ + 3% CO ₂	6.77ef	6.53fg	6.10gh	6.47D	3.00def	2.83f	3.12c-f	2.98D	1.34def	1.37cde	1.49a	1.40A
Active MA 10% O ₂ + 6% CO ₂	6.80ef	7.47fg	6.20gh	6.49D	3.30cd	3.15cde	3.42c	3.29B	1.31d-g	1.38bcd	1.47ab	1.39A
Mean	7.51A	6.89B	6.62C	-	3.11B	3.00B	3.58A	-	1.23C	1.31B	1.43A	-

Means within each column followed by the same letter (s) are not significantly different at 5% level.

Fruits of MA treatments, except of control treatment, were packed in sealed carton boxes at rate of 190± 10 g fruits / liter.