ATO-DLO

Effects of low temperature, CA conditions and (pre)treatments on quality aspects of Dutch bell peppers

CONFIDENTIAL

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Contents

1. Summary

TRANSFRSH CORPORATION from Salinas, California, asked ATO-DLO in Wageningen, The Netherlands, to investigate possibilities of transport in CA containers. Research should be concentrated on effects of low temperatures, CA conditions and (pre)treatments on the quality of Dutch grown bell peppers.
ATO-DLO performed three experiments. The influence of 0%CO2 + 3%O2, 5%CO2 + 3%O2 and 10%CO2 + 3%O2 at 8°C and 1°C was compared with air storage in the first experiment. Stem dips in chlorinated water (0.1%) and in 0.5% benomyl and storage in a liner were added as a side experiment. 2%, 1% and 0.5% Oxygen at 1°C were compared with air storage in the second experiment. Pretreatments in this experiment were dipping whole fruits in clean tap water and in chlorinated (100 ppm) water. 0%, 10% and 20% Carbon dioxide combined with 1 and 2% oxygen were compared with air storage at 1°C in the third experiment. Storage duration was the same in all experiments: 14 days of CA storage, followed by 4 days in air at 8°C and 3 days in air at 20°C. The fruits were assessed on quality aspects (acceptability, low temperature breakdown, softness, stem decay, fruit decay, waterstain, fruit colour and stem colour) after all mentioned periods. The experiments were performed with green, orange, yellow and red bell peppers, grown in The Netherlands.
Lowering the temperature to 1°C and CA conditions in the first experiment improved keepability aspects after 14 days of storage. However these effects disappeared or even turned into negative effects after prolonged storage at higher temperatures. Low oxygen conditions caused heavy pitting in the second experiments and other keepability aspects were not improved in the second experiment. High carbon dioxide contents (at low oxygen contents) appeared to be harmfull for firmness in the final experiment. The treatments with chlorinated water and benomyl inhibited decay on stems and/or fruit surface. However this effect did not prevent too high numbers of unacceptable fruits.

A replacement of air transport by overseas transport during 2 weeks, taking into account a sufficient quality level after an additional week at higher temperatures is not possible for Dutch grown bell peppers. This final conclusion could perhaps only need correction, if it were possible to select growers with extremely well keepable fruits.

2. Introduction

The storage possibilities of Dutch grown green bell pepper fruits are limited to 1-2 weeks at 7-8°C according to a Dutch recommendation (Anon, 1985). Several attempts have been performed to see if this period could be prolonged. Possibilities for a longer storage period could be a lower temperature than 7-8°C or CA storage. Lowering the temperature however increased the risk of low temperature breakdown, resulting in pitting (Hardenburg et al., 1986), but full ripe red and yellow bell peppers suffered only slightly from this temperature in other research (Stork & Schouten 1986)
Most CA storage research was performed with green bell peppers. Low oxygen content may reduce respiration activity and ethylene production, whereas a high carbon dioxide content may improve green colour retention (Saltveit, 1993).
The reaction of full ripe bell pepper fruits is not quite clear. Storage in 3%CO2 + 3%O2 gave higher amounts of marketable produce than storage in air (Wiersma & Stork, 1975). Also a small but positive effect of a reduction in oxygen content to 2-4% was found in other research (Polderdijk et al, 1986). Small but negative results were sometimes also found (Hughes et al, 1981).

Dutch grown bell peppers are exported as air freight to the U.S..It would be worthwhile to replace air transport by sea transport, since the last method is cheaper. TRANSFRESH CORPORATION asked therefore ATO-DLO to perform research on the possibilities of lowering temperatures and changing air compositions. Research was executed with green and ripe orange, yellow and red bell peppers in three different experiments. At first some CA conditions were tested at two temperatures, secondly a test was performed on some very low oxygen contents and finally a screening on the influence of high carbon dioxide contents was performed.
This report contains a description of the three tests and conclusions for practical application of CA conditions for green and full ripe Dutch grown bell peppers.

3. Material and Methods

3.1 Experiment 1

Produce
The influence of different CA conditions at 8 and 1°C was tested on green, red, orange and yellow bell peppers. The bell peppers were bought from the auction "De Kring", located in Bleiswijk. The fruits were picked, brought to the auction and cooled down to 8°C during the night. The fruits were then transported from the auction to ATO-DLO in the early morning of the following day on which the experiment was started on 31 August 1995. Green, orange, yellow and red fruits were used in this experiment. Every colour was taken from different growers. Data of growers are summarized in table 1, which also contains data of experiment 2.

Table 1: Data of growers and produce

Auction code	Name and Address Grower	Colour, Variety, Class
Experiment 1		
KR 3067	BV Gebr. de Groot Hyacintenweg 34 2665 NC Bleiswijk	Green: Mazurka, I
KR 1149	D.A. v.d. Spek Rodenrijseweg 535B 2651 AR Berkel Rodenrijs	Orange: Nassau, I
KR 1337	Fa. P. Slaman Tuinbouwweg 2 2742 KP Waddinxveen	Yellow: Kelvin, I
KR 1518	J.A. v.d. Beukel Leeweg 2 2651 CL Berkel Rodenrijs	Red: Cuby, I Super
Experiment 2		
KR 1106	G.H.M. van Kester Munnikenweg 12 2651 LZ Berkel Rodenrijs	Yellow: Kelvin, I
KR 1166	H.J. Sonneveld en Zonen Anthuriumweg 5 2665 KV Bleiswijk	Red: Mazurka, I

The fruits were taken out of the cardboard boxes and randomized over the same boxes, which were placed then in the CA containers in the cold room. The CA conditions were started immediately.

Storage
CA conditions were realized in CA containers, which are controlled automatically on air composition. The polypropylene containers, placed in cold room, are equipped with possibilities of injections with CO2, air and nitrogen. They are provided with a

potassium-hydroxide scrubber for CO2 removal. An internal air circulation is realized with a small fan, which presses the air from one side of the container through a duct to the other side of the container. On a central place small pumps are continuously running. They circulate the air of every container through tubes to and from the container. This duct is connected to an extra duct to the CO2 and O2 analysers. Every container is analysed every hour. A process computer controls the air compositions by controlling valves for an inlet of gasses and switching on and off the CO2-scrubbers.

(Pre)treatments
Additional red bell peppers samples were taken for the following (pre)treatments:

a. a small piece of the stem was cut from the fruits and the stem was then dipped into a 0.1% chlorinated water solution.
b. fruits were packed in a plastic bag, in which 8 perforations of 20 mm were made. The filled bag was folded into the cardboard box.
c. stems were dipped into a 0.5% benomyl solution.

The cardboard boxes were placed into all containers set to air storage and 5%CO2 + 3%O2. For these additional samples the same storage durations and quality assessments were done as the rest of experiment 1.

The CA containers were set to the air compositions summarized in table 2 (together with the conditions of the other two experiments). 2 replicates were used in two cold rooms at 8°C and 1°C. Storage time was 14 days. After this 2 weeks the fruits were stored in air during 4 days at 8°C and finally in air during 3 days at 20°C. One box of every colour was put into every container. R.H. was measured once during the experiment during 24 hours in one container. The average R.H. was 90%.

Quality Assessments
The bell peppers were assessed on quality parameters after 14 days in CA conditions and after the additional periods of 4 days at 8°c and 3 days at 20°C. These parameters were: acceptability, green colour (only green fruits), low temperature breakdown, softness, stem decay, fruit decay and waterstain. At the final assessment stem colour was added. All these parameters were determined visually or by hand. The procedure was as follows: 20 fruits were taken out of every box and assessed on all mentioned criteria. These 20 fruits were put back into the box, which was placed the in the cold room until the next assessment. This procedure was repeated two times.
Every individual fruit of a sample of 20 fruits was classified as 0 (nothing of the parameter), 1 (some of the parameter), 2 (moderate) or 3 (severe). This was a little bit different for acceptability: 0 = salable, 1 = not salable because of small defects, 2 = not salable because of moderate defects and 3 = not salable because of serious defects.

Weight loss was determined by weighing the fruits of every box after the three storage times. Firmness was determined in two ways. All the fruits were inspected on softness by hand and secondly: some fruits of every red box were measured by the Instron. Deformation of the complete fruit was measured by compression with a metal plate until a maximum of 20 N was reached. The results are expressed as strain in %.

Respiration
Respiration measurements were done by putting 1 red, 1 yellow, 1 orange and 1 green box of fruits in 70 litre flow-through gastight stainless steel containers. These containers were at first flushed with air, after that with 0%CO2 + 3%O2, then with 5%CO2 + 3%O2 and finally with 10%CO2 + 3%O2. The CO2 contents were measured immediately after stopping the gas stream and this measurement was repeated after some hours. The increase in CO2 content was measured with an infrared ADC, 7000 Gas Analyser system; (Thermo Instruments BV, Breda, The Netherlands). Respiration activity was calculated in ml.kg.hr from these changes.

Statistical Analysis
Analysis of variance of every storage time of every parameter was executed with the program GENSTAT release 3.1.

3.2 Experiment 2

The influence of low oxygen conditions (see table 2) was compared in 2 replicates with air storage at 1°C on yellow and red bell peppers (see table 1). Immediately before storage some treatments were done. The fruits were held in clean tapwater during 1 minute. Fruits were also dipped during 1 minute in a 100 ppm Chloride solution. The same procedure concerning fruits, storage and quality assessments described for experiment 1 was followed in this experiment. However: Instron firmness measurements were not executed. Respiration activity was measured by leading the gas stream through 1.5 litre glass containers, in which two bell pepper fruits were placed. Measurement of the accumulated CO2 and the decreased O2 content was done with a GC (Chrompack Micro GC; CP 2002). The experiment was started 19th October 1995.

3.3 Experiment 3

High carbon dioxide contents in low oxygen contents were tested at 1°C on red and yellow bell peppers. The conditions in the flow through containers are summarized in table 2.
The test was performed with 15 fruits per condition of every colour. No replicates were used in this screening. The same procedure followed in experiment 2 concerning fruits, storage and assessments was used in this experiment. The respiration activity was not established. Start of the experiment: 26th October 1995

Table 2: Overview of storage conditions in experiment 1, 2 and 3.

Experiment No	Colour fruits	Temp °C	%O2	%CO2
1	green	8°C	21	0
	orange	1°C	3	0
	yellow		3	5
	red		3	10
2	yellow	1°C	21	0
	red		2	0
			1	0
			0.5	0
3	yellow	1°C	21	0
			2	0
			2	10
			2	20
			1	0
			1	10
			1	20

4. Results

4.1 Experiment 1

Original data of the assessments are added to this report as annexe 1.

4.1.1 Acceptability

Average acceptability is presented in table 3 for colour, storage time, temperature and CA condition.

Table 3: Influence of colour, temperature and CA condition on acceptability* of bell peppers.

Parameter		Storage time 14 days	14+4 days	14+4+3 days
Colour:	green	0.35 b	0.94 a	1.95 a
	orange	1.02 a	0.83 b	1.51 b
	yellow	0.08 c	0.28 d	1.25 c
	red	0.34 b	0.61 c	0.94 d
Temperature	1°C	0.35 e	0.64 e	1.49 e
	8°C	0.54 f	0.69 e	1.34 e
CA Condition	0%CO2+21%O2	0.56 p	0.68 p	1.39 p
	0%CO2+3%O2	0.39 q	0.63 p	1.29 p
	5%CO2+3%O2	0.48 pq	0.66 p	1.42 p
	10%CO2+3%O2	0.36 q	0.68 p	1.56 p

Score 0 -3; averages with the same character are not significantly different ($p<5\%$). Do not compare averages in different columns.

The influence of the colour was significant for acceptability after each storage time. The green fruits showed problems already after 14 days of storage in CA conditions because of low temperature breakdown symptoms (pitting). After the longest storage period the green fruits are worst, but the other colours also show relatively high scores, which are different amongst each other.
The influence of temperature is limited. Only after 14 days of storage a small but positive influence is found for 1°C. The CA conditions 10%CO2 + 3%O2 and 0%CO2 + 3%O2 are different from storage in air. However this positive effect disappeared after longer storage times in air at higher temperatures.

The interaction colour*temperature was significant after all three storage times. This means, that the different colours showed a different behaviour of quality deterioration in time. The green fruits showed rather big differences between 1 and 8°C because of LTB at 1°C. Yellow and red fruits showed increases in the number of fruit and stem decay at 1 and 8°C.

4.1.2 Low Temperature Breakdown

The influence of colour, temperature and CA conditions on low temperature breakdown is presented in table 4.

Table 4: Average influence of colour, temperature and CA conditions on low temperature breakdown* on bell peppers.

Parameter		Storage time 14 days	14+4 days	14+4+3 days
Colour:	green	0.138 a	0.43 a	0.52 a
	orange	0.003 b	0.03 b	0.17 b
	yellow	0.000 b	0.04 b	0.03 c
	red	0.003 b	0.01 b	0.09 bc
Temperature	1°C	0.069 e	0.21 e	0.34 e
	8°C	0.003 f	0.05 f	0.07 f
CA Condition	0%CO2+21%O2	0.047 p	0.12 p	0.11 q
	0%CO2+3%O2	0.022 p	0.11 p	0.13 q
	5%CO2+3%O2	0.056 p	0.13 p	0.24 p
	10%CO2+3%O2	0.019 p	0.15 p	0.32 p

Score 0 -3; averages with the same character are not significantly different ($p<5\%$). Do not compare averages in different columns.

The green fruits are different from the other colours, which do not differ very much among each other. Only in the last assessments the yellow fruits differ from orange and red.
The influence of the low temperature on LTB is quite clear: 1°C always causes more LTB than 8°C. The low temperature breakdown symptoms (pitting) seem to decrease a little bit during the storage at higher temperatures.
CA conditions do not influence LTB. Only in the last assessment a significant difference was found between 0 + 21 and 0 + 3 on the one side and 5 + 3 and 10 + 3 on the other side. It seems as if the addition of CO2 increases LTB symptoms.
Colour*temperature interactions were significant during all three assessments. This simply means, that the influence of the temperature was different for the different coloured fruits.

4.1.3 Softness

The results of this parameter are presented in table 5.

Table 5: Influence of colour, temperature and CA conditions on softness* of bell peppers.

Parameter		Storage time 14 days	14+4 days	14+4+3 days
Colour:	green	0.018 a	0.184 a	0.264 a
	orange	0.022 a	0.019 b	0.034 b
	yellow	0.100 a	0.016 b	0.025 b
	red	0.006 a	0.009 b	0.006 b
Temperature	1°C	0.017 e	0.070 e	0.118 e
	8°C	0.056 e	0.044 e	0.047 f
CA Condition	0%CO2+21%O2	0.000 p	0.016 q	0.050 q
	0%CO2+3%O2	0.022 p	0.034 q	0.037 q
	5%CO2+3%O2	0.097 p	0.072 pq	0.066 q
	10%CO2+3%O2	0.028 p	0.106 p	0.179 p

Scores 0-3; averages with the same character are not significantly different. Do not compare averages in different columns.

No differences were detectable in the first assessment after 14 days of storage. Significant influence was however found in the following assessments. Green fruits showed more firmness loss than the other colours, whereas the CA condition 10%CO2 + 3%O2 was worse than the other conditions. 1°C proved to be worse than 8°C.
In the third assessment interactions between colour and temperature, between colour and CA conditions and between temperature and CA conditions were present. Further analysis showed, that the background of these interactions is found in the green fruits. These fruits suffer from an extensive firmness loss, if they are stored at low temperature and high CO2 contents.

4.1.4 Instron firmness

The Instron readings on the three storage times are presented in the figures 1, 2 and 3.

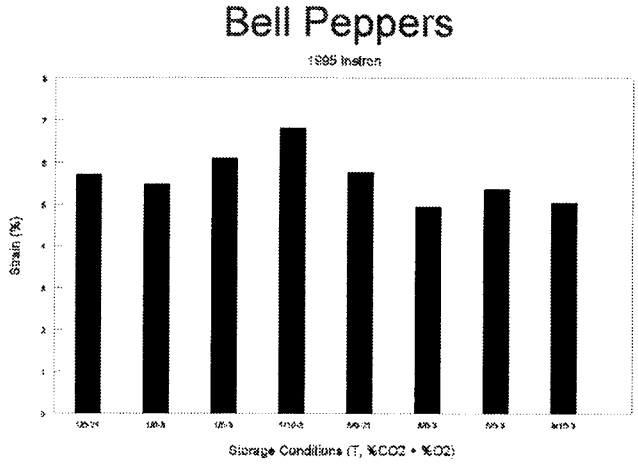

Fig 1: Firmness of red bell peppers stored during 14 days in CA conditions at two temperatures.

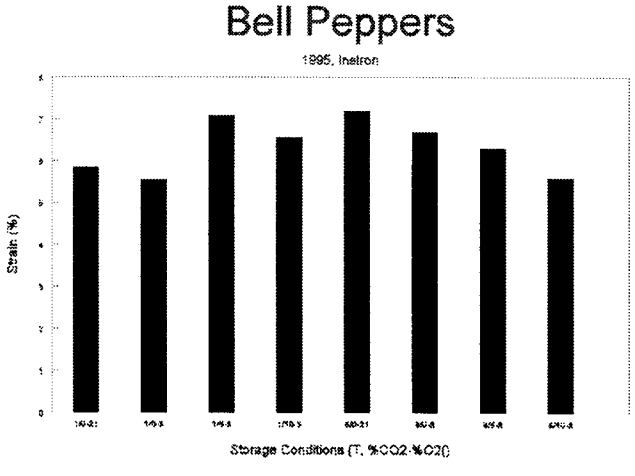

Fig 2: Firmness of red bell peppers stored in CA conditions during 14 days at two temperatures followed by 4 days at 8°C in air.

Some difference in temperature can be observed in figure 1. A somewhat better firmness retention is realised at 1°C. 10%CO2 + 3%O2 seems a little bit better than the other conditions at 1°C.
These differences are disappearing after the extra 4 days at 8°C (fig 2). Firmness retention seems to be better at 8°C than at 1°C after the extra 3 days at 20°C (fig 3), whereas 10%CO2 + 3%O2 is worse in comparison with the other CA conditions.

These observations agree with the sensory assessments of firmness. Final firmness loss (measured as higher scores for softness) was bigger at 1°C and in 10%CO2 + 3%O2 (see table 5).

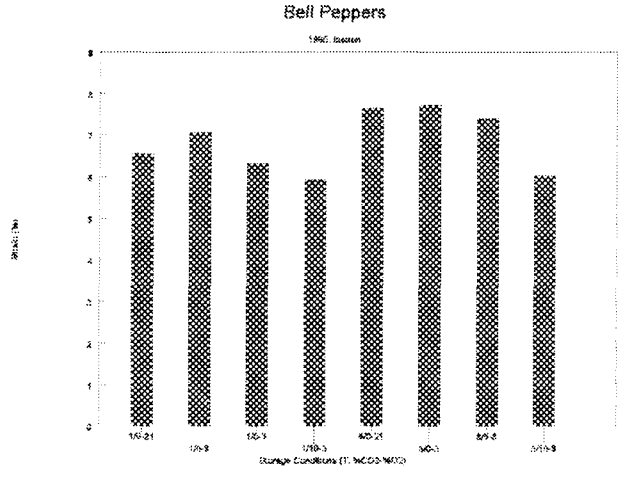

Fig 3: Firmness of red bell peppers stored 14 days in CA conditions at two temperatures followed by 4 days at 8°C and 3 days at 20°C.

4.1.5 Stem decay

The results of the assessments on stem decay are summarized in table 6.

Table 6: Influence of colour, temperature and CA conditions on stem decay* of bell peppers.

Parameter		Storage time 14 days	14+4 days	14+4+3 days
Colour:	green	0.137 a	0.251 b	1.816 a
	orange	0.038 bc	0.009 c	0.256 d
	yellow	0.006 c	0.059 c	0.425 cd
	red	0.066 b	0.334 a	1.141 b
Temperature	1°C	0.019 f	0.198 e	1.093 e
	8°C	0.105 e	0.129 f	0.727 f
CA Condition	0%CO2+21%O2	0.084 p	0.211 p	0.734 r
	0%CO2+3%O2	0.084 p	0.140 p	0.750 r
	5%CO2+3%O2	0.059 q	0.153 p	0.954 qr
	10%CO2+3%O2	0.019 r	0.150 p	1.200 p

Scores 0-3; averages with the same character are not significantly different. Do not compare averages in different columns.

The most serious stem decay symptoms were found after all three storage times on the green bell peppers. This difference with the other coloured fruits was already detectable after 14 days of storage. Red bell peppers also showed serious stem decay after the longest storage time. Orange and yellow bell peppers were the best concerning stem decay, allthough these bell peppers finally showed relatively high scores.
1°C showed less stem decay than 8°C in the first assesment. This effect was reversed in the two following assessments. This has something to do with interactions between colour, temperature and CA conditions. A similar effect is detectable for 10%CO2 + 3%O2. This condition showed less stem decay than the other conditions in the first assessment. After 14+4+3 days of storage 10%CO2 + 3%O2 showed the highest scores.

4.1.6 Fruit decay

The results of the assessments on fruit decay is presented in table 7.

Table 7: Influence of colour, temperature and CA conditions on fruit decay* of bell peppers.

Parameter		Storage time 14 days	14+4 days	14+4+3 days
Colour:	green	0.075 b	0.162 b	0.581 a
	orange	0.003 c	0.016 c	0.684 a
	yellow	0.025 c	0.028 c	0.913 a
	red	0.431 a	0.567 a	0.738 a
Temperature	1°C	0.044 f	0.159 f	0.698 e
	8°C	0.223 e	0.227 e	0.759 e
CA Condition	0%CO2+21%O2	0.219 p	0.234 p	0.812 p
	0%CO2+3%O2	0.147 q	0.188 p	0.609 p
	5%CO2+3%O2	0.122 q	0.194 p	0.660 p
	10%CO2+3%O2	0.047 r	0.156 p	0.834 p

Scores 0-3; averages with the same character are not significantly different. Do not compare averages in different columns.

Red bell peppers showed the most serious fruit decay symptoms in the first two assessments. In the last assessment no significant difference was found among the different coloured bell peppers. This means that fruit decay developed quickly in green, yellow and orange bell peppers. A similar phenomenon is seen for temperature. In the first two assessments 1°C shows less fruit decay than 8°C. This difference disappeared after the longest storage time.
All three CA conditions showed less fruit decay symptoms in the first assessment. This difference also disappeared in the other assessments.

4.1.7 Waterstain

The results of the waterstain assessments are presented in table 8.

Table 8: Influence of colour, temperature and CA conditions on waterstain* of bell peppers.

Parameter		Storage time 14 days	14+4 days	14+4+3 days
Colour:	green	0.025 b	0.031 c	0.018 b
	orange	1.296 a	1.206 a	1.087 a
	yellow	0.050 b	0.116 b	0.091 b
	red	0.066 b	0.022 c	0.006 b
Temperature	1°C	0.313 f	0.336 e	0.292 e
	8°C	0.405 e	0.352 e	0.309 e
CA Condition	0%CO2+21%O2	0.369 p	0.369 p	0.353 p
	0%CO2+3%O2	0.365 p	0.350 p	0.290 p
	5%CO2+3%O2	0.371 p	0.347 p	0.306 p
	10%CO2+3%O2	0.331 p	0.309 p	0.253 p

Scores 0-3; averages with the same character are not significantly different. Do not compare averages in different columns.

Orange bell peppers showed the most serious waterstain symptoms in all assessments. There is hardly any increase of this problem during the three observation times. Green, yellow and red fruits do not suffer very much from this problem, which is influenced only a little bit by temperature. Only in the first assessment 1°C is less than 8°C. CA conditions do not have any influence on waterstain.

4.1.8 Colour

The green fruits were assessed on colour. The average results of this assessment are given in table 9.

Table 9: Average colour* scores of green bell peppers stored at two temperatures and in different air compositions.

Temp.	CA condition	Stem Colour after 14 days	after 14+4 days	after 14+4+3 days
1°C	0%CO2+21%O2	0.000	0.000	0.000
	0%CO2+3%O2	0.000	0.025	0.150
	5%CO2+3%Ô2	0.000	0.000	0.000
	10%CO2+3%O2	0.000	0.000	0.000
8°C	0%CO2+21%O2	0.025	0.025	0.000
	0%CO2+3%O2	0.000	0.050	0.200
	5%CO2+3%O2	0.000	0.000	0.075
	10%CO2+3%O2	0.000	0.000	0.000

Scores 0-3 (changes into red colour).

The changes of green coloured fruits were only incidental and not related to CA conditions or temperature.

4.1.9 Stem Colour

The green colour of the stems changed during storage at high temperature. This parameter was taken into consideration from the second assessment. The average results are given in table 8.

Table 10: Influence of colour, temperature and CA conditions on stem colour* of bell peppers.

Parameter		Storage time 14+4 days	14+4+3 days
Colour:	green	1.286 a	1.999 a
	orange	0.000 b	0.072 c
	yellow	0.003 b	0.362 b
	red	0.000 b	0.175 c
Temperature	1°C	0.266 f	0.705 e
	8°C	0.378 e	0.599 f
CA Condition	0%CO2+21%O2	0.259 p	0.587 p
	0%CO2+3%O2	0.392 p	0.721 p
	5%CO2+3%O2	0.322 p	0.681 p
	10%CO2+3%O2	0.316 p	0.619 p

Scores 0-3; averages with the same character are not significantly different. Do not compare averages in different columns.

It is quite clear that stem colour changes especially occur in green bell peppers. Temperature has a certain but not constant effect, whereas CA conditions do not influence this quality characteristic. After 14+4+3 days it was difficult to distinguish the difference between stem colour and stem decay, which is accompanied by discolouration especially on yellow fruits.

4.1.10 Weight Loss

The calculated weight losses appeared to be generally negative after the first two weeks of storage. There is of course no explanation for the increase in weight of the bell peppers. We do not know what has happened. The results concerning weight loss were skipped in this experiment.

4.1.11 Respiration Activity

The results of the measurements of respiration activity are shown in figure 4

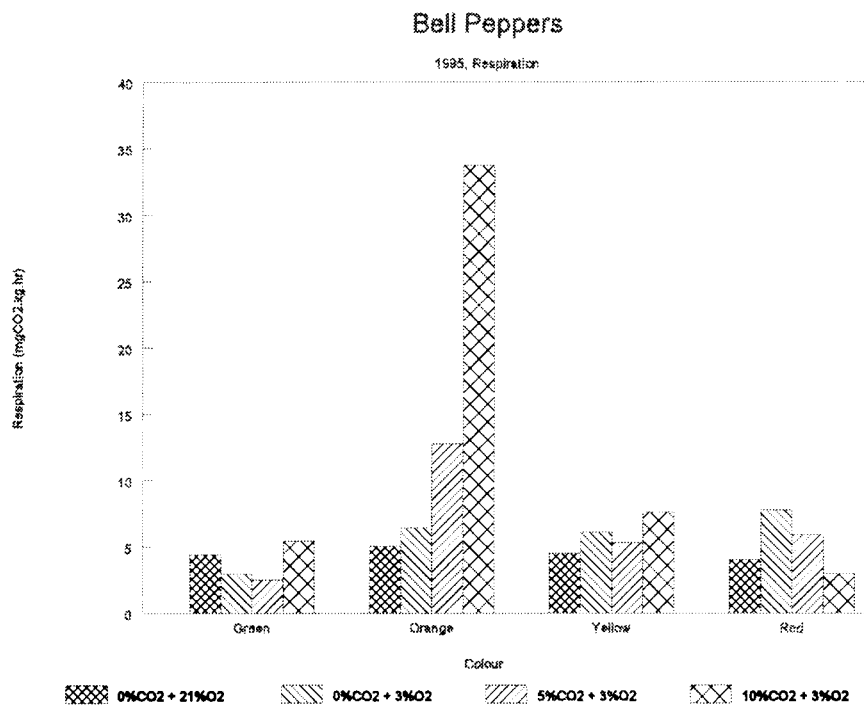

Fig 4: Respiration activity of bell peppers stored in CA conditions at 8°C.

The green fruits show a small decrease in 0%CO2 + 3%O2 and 5%CO2 + 3%O2. However, in 10%CO2 + 3%O2 an increase can be observed. Orange fruits (and also to a lesser extent yellow fruits) are stimulated in their activity by all conditions and a very big increase is found in 10%CO2 + 3%O2. The reason of this increase is not understood. Red fruits show a changing behaviour in CA conditions and contrary to the other colours a decrease in activity was found at 10%CO2 + 3%O2.

4.1.12 (Pre)treatments

Variance analysis was performed on the complete results, also containing the storage times. The results are shown in table 11.

Table 11: Effects of (pre)treatments on different quality parameters of red bell peppers stored in air and in 5%CO2 + 3%O2 at 8°C during different times.

	ACC WST	LTB	SOFT	STD	F R D
none	0.832 b 0.058a	0.004 a	0.004 a	0.342 a	0.781 b
Chlorine	0.704 b 0.000b	0.008 a	0.008 a	0.075 b	0.738 b
liner	1.375 a 0.000b	0.005 a	0.000 a	0.391 a	1.479 a
benomyl	0.742 b 0.000	0.012 a	0.000 a	0.171 b	0.821 b
CA/ 0 + 21	1.063 e 0.008e	0.007 e	0.006 e	0.193 f	1.131 e
/ 5 + 3	0.763 f 0.021e	0.008 e	0.000 e	0.296 e	0.778 f
Time 14d	0.651 q 0.031p	0.000 p	0.000 p	0.096 q	0.798 q
14+4d	0.810 q 0.006q	0.006 p	0.006 q	0.149 q	0.796 q
14+4+3d	1.279 p 0.006q	0.016 p	0.006 p	0.488 p	1.270 p

Scores 0-3; averages with the same character are not significantly different; do not compare averages in different columns.
ACC = acceptability, LTB = low temperature breakdown, SOFT = softness, STD = stem decay, FRD = fruit decay, WST = waterstain.

Packaging bell peppers in liners has a very bad effect op the quality of the fruits. The score for acceptability is much higher, meaning that the quality is much less in comparison with the other (pre)treatments. There is no effect of the treatments on low temperature breakdown nor on Softness. The chlorine dip and benomyl treatment of the stem show lower scores for stem decay (STD). Both are effective in suppressing development of fungus growth on the stems. The liner shows a much higher score for fruit decay and indeed a quick development of decay became visible especially during storage at higher temperatures.
Interactions between treatment and time were significant in most cases meaning that a bad influence became stronger during storage. Especially storage in liners showed a quick increase in fruit decay. The average score after 14 days for fruit decay was 0.82. This increased until 1.04 after the extra 4 days at 8°C and to 2.56 after the extra 3 days at 20°C. This interaction was also significant for acceptability scores: after 14 days: 0.70, after 14 + 4 days: 1.20 and after 14+4+3 days: 2.22.
Storage in 5%CO2 + 3%O2 showed lower scores for acceptability and fruit decay. On the other hand higher scores were found for stem decay.
Finally: waterstain appeared to be a small problem for these red bell peppers.

4.1.13 Discussion experiment 1

The practical relevance of the results of experiment 1 can be evaluated in terms of the effects of positive or negative effects of temperature, CA conditions and (pre)treatments on keepability. An overview of the results of experiment 1 concerning the effect of 1°C (compared with 8°C) and application of CA conditions (compared with air storage)is presented in table 12 using symbols for positive keepability effects (+), no effect (.) and negative keepability effects (-).

Table 12: Influence of storage temperature CA conditions and storage time on different aspects of quality of bell peppers.

Storage	Duration	Quality Parameter						
		ACC*	LTB*	SOF*	STD*	FRD*	WST*	STC*
Temp.	14	+	-	+	+	+	+	
	14+4	.	-	.	-	+	.	+
	14+4+3	.	-	-	-	-	.	-
CA Cond.	14	+	.	.	+	+	.	
	14+4	.	.	-	.	.	.	.
	14+4+3	.	-	-	-	.	.	.

* ACC = Acceptability, LTB = Low temperature breakdown, SOF = firmness measured by hand, STD = stem decay, FRD = Fruit decay, WST = waterstain and STC = stem colour.

5 positive effects (+) and 1 negative effect (-) are found directly after 14 days of storage for lowering the temperature from 8°C to 1°C. This turns into 0 positive, 5 negative and two times no effects at the end of the total storage duration. This means, that although softness, stem decay, fruit decay and stem colour may be attributed partly to the effect of 1°C on green bell peppers, that the overall effect of 1°C is not positive.
A similar effect of CA conditions on quality aspects of bell peppers was also found. Positive effects of CA conditions on quality disappeared or turned into negative effects. The effect on acceptability was positive for both temperature and CA conditions. However, these effects disappeared after prolonged storage duration at high temperature.
The effect of dipping stems in a chlorine or benomyl solution was positive concerning stem decay. However, this effect is not reflected in acceptability. Liners showed pronounced negative effects on fruit decay and this effect is reflected as a negative effect on acceptability.

A first conclusion from experiment 1 is, that neither lowering the temperature to 1°C nor the application of the used CA conditions improve the keepability and are therefore not recommended. The first conclusion is further supported by an additional observation. Extra samples of all colours were collected at the auction after 14 days storage of the fruits in experiment 1. These additional samples were stored in the same way as the fruits of experiment 1 eg. 4 days at 8°C plus 3 days at 20°C. The assessments of the additional samples together with the "normal" samples of experi-

ment 1 after 14+4+3 days showed a much better appearance of the "fresh" fruits. Acceptability scores were 0.20 (green), 0.60 (orange), 0.20 (yellow) and 0.15 (red). This is much lower the scores of the 2 weeks older fruits of experiment 1, which showed average scores of between 1 and 2.
Secondly: the use of liners (which promote condensation in the liner) must be considered as dangerous for the keepability of bell peppers. Dipping stems in benomyl or chlorinated water promote keepability.

4.2 Experiment 2

The raw data of experiment 2 are added to this report as annexe 2.

4.2.1 Acceptability

The results of the acceptability measurements are shown in table 13.

Table 13: Average influence of colour, CA conditions and (pre)treatments on acceptability* of bell peppers stored at 1°C.

		Storage time 14 days	14+4 days	14+4+3 days
Colour:	red	0.279 a	0.746 a	1.227 a
	yellow	0.342 a	0.817 a	1.719 b
CA condition	0%CO2 + 21%O2	0.375 e	0.642 g	1.329 e
	0%CO2 + 2%O2	0.283 fg	0.725 fg	1.613 e
	0%CO2 + 1%O2	0.342 ef	0.858 ef	1.550 e
	0%CO2 + 0.5%O2	0.242 g	0.900 e	1.400 e
Pretreatment	none	0.400 p	0.950 p	1.756 p
	Chlorine	0.262 q	0.681 q	1.097 q
	water	0.269 q	0.712 q	1.566 p

Score 0 - 3; averages with the same character are not significantly different (p<5%). Do not compare averages in different columns.

Yellow bell peppers showed at the end of the observation period a higher score for acceptability than red fruits. The highest scores among the CA conditions are for air and 1%O2 storage after 14 days. This picture has changed at the second observation. The positive effect of 2 and 0.5%O2 after 14 days changed into a negative effect: the highest scores are found for 1 and 0.5%O2 and even 2%O2 is worse in comparison with air stored fruits. Low oxygen conditions may therefore be harmful to bell peppers.
The treatments with water and 100 ppm chlorine showed lower scores than the untreated fruits. The differences among the treatments are even more pronounced at the end of the observation period than earlier.

4.2.2 Low Temperature Breakdown/Pitting

Excessive pitting was observed in this experiment. It was not quite clear during the assessments if this pitting was caused by the low temperature of 1°C or too low oxygen contents or by both. We have taken all pitting together in one assessment, which is shown in table 14.

Table 14: average influence of colour, CA conditions and (pre)treatments on pitting* of bell peppers stored at 1°C.

		Storage time 14 days	14+4 days	14+4+3 days
Colour:	red	0.000 a	0.602 a	0.654 a
	yellow	0.000 a	0.419 b	0.523 b
CA condition	0%CO2 + 21%O2	0.000 e	0.183 h	0.246 g
	0%CO2 + 2%O2	0.000 e	0.350 g	0.367 g
	0%CO2 + 1%O2	0.000 e	0.558 f	0.608 f
	0%CO2 + 0.5%O2	0.000 e	0.950 e	1.133 e
Pretreatment	none	0.000 p	0.444 q	0.534 p
	Chlorine	0.000 p	0.509 pq	0.644 p
	water	0.000 p	0.578 p	0.588 p

Score 0 -3; averages with the same character are not significantly different ($p<5\%$). Do not compare averages in different columns.

No pitting was observed after 14 days. After 18 and 21 days heavy pitting was found. More pitting was observed on red than on yellow fruits. It is quite clear after 18 days, that the low oxygen conditions cause heavy pitting. Significant differences can be observed among all oxygen contents. The lower the oxygen content the heavier the pitting. This tendency is also found after the extra 3 days at 20°C.

4.2.3 Softness

The results of the assessments on this parameter are given in table 15.

Table 15: average influence of colour, CA conditions and (pre)treatments on softness* of bell peppers stored at 1°C.

		Storage time 14 days	14+4 days	14+4+3 days
Colour:	red	0.000 a	0.019 a	0.046 a
	yellow	0.003 a	0.060 b	0.119 b
CA condition	0%CO2 + 21%O2	0.013 e	0.021 fg	0.125 e
	0%CO2 + 2%O2	0.029 e	0.008 g	0.046 e
	0%CO2 + 1%O2	0.013 e	0.058 ef	0.096 e
	0%CO2 + 0.5%O2	0.013 e	0.071 e	0.063 e
Pretreatment	none	0.003 p	0.031 p	0.081 p
	Chlorine	0.013 p	0.038 p	0.059 q
	water	0.034 p	0.050 p	0.106 p

Score 0 -3; averages with the same character are not significantly different (p<5%). Do not compare averages in different columns.

The influence of storage parameters is limited. Only in the second assessment a small but negative influence is detected on softness. Especially 1 and 0.5% cause more softness. However, this effect was not found in the first and third assessments. The yellow fruits show somewhat higher scores for softness during the second and third assessments.
Some positive influence seemed to be present from the treatment with chlorinated water at the final assessment after 21 days.

4.2.4 Stem decay

The assessments on stem decay are summarized in table 16.

Table 16: average influence of colour, CA conditions and (pre)treatments on stem decay* of bell peppers stored at 1°C.

		Storage time 14 days	14+4 days	14+4+3 days
Colour:	red	0.090 a	0.144 b	0.740 b
	yellow	0.006 b	0.325 a	1.392 a
CA condition	0%CO2 + 21%O2	0.062 e	0.179 e	0.608 f
	0%CO2 + 2%O2	0.037 e	0.246 e	1.287 e
	0%CO2 + 1%O2	0.050 e	0.275 e	1.196 e
	0%CO2 + 0.5%O2	0.042 e	0.238 e	1.176 e
Pretreatment	none	0.112 p	0.353 p	1.450 p
	Chlorine	0.003 q	0.100 r	0.506 q
	water	0.028 q	0.250 q	1.241 p

Score 0 -3; averages with the same character are not significantly different (p<5%). Do not compare averages in different columns.

Stem decay scores of red bell peppers were somewhat higher than the scores of the yellow fruits at the beginning of the observation period, but this was reversed during the second and third assessments. The yellow peppers suffered considerably more from stem decay than red fruits at the end of the experiment. Low oxygen conditions do not have an influence on stem decay during the first two assessments. The lowest score for stem decay after 21 days was found for fruits stored in air. Low oxygen conditions showed a negative influence on this quality parameter after 21 days.
The influence of the (pre)treatments is rather strong. The fruits washed with 100 ppm chlorine showed the lowest scores, meaning that stem decay was suppressed by this treatment. Washing with water also showed lower scores than untreated fruits. This effect persisted until 21 days of storage.

4.2.5 Fruit decay

The results of the assessments on fruit decay are presented in table 17.

Table 17: average influence of colour, CA conditions and (pre)treatments on fruit decay* of bell peppers stored at 1°C.

		Storage time 14 days	14+4 days	14+4+3 days
Colour:	red	0.179 a	0.313 a	0.570 a
	yellow	0.025 b	0.071 b	0.679 a
CA condition	0%CO2 + 21%O2	0.125 e	0.179 e	0.846 e
	0%CO2 + 2%O2	0.121 e	0.250 e	0.575 e
	0%CO2 + 1%O2	0.083 e	0.129 e	0.575 e
	0%CO2 + 0.5%O2	0.079 e	0.208 e	0.503 e
Pretreatment	none	0.216 p	0.359 p	0.972 p
	Chlorine	0.037 q	0.100 q	0.331 r
	water	0.053 q	0.116 q	0.571 q

Score 0 -3; averages with the same character are not significantly different ($p<5\%$). Do not compare averages in different columns.

Only during the first and second assessments red bell peppers show somewhat more fruit decay than the yellow fruits. This difference has disappeared during the final assessment. The influence of low oxygen conditions was absent. The treatments with chlorinated water and pure water show less fruit decay than the untreated fruits and this effect persisted until the final assessment.

4.2.6 Waterstain

The results of the assessments on this parameter are presented in table 18.

Table 18: average influence of colour, CA conditions and (pre)treatments on waterstain* of bell peppers stored at 1°C.

		Storage time 14 days	14+4 days	14+4+3 days
Colour:	red	0.058 b	0.042 b	0.046 b
	yellow	0.413 a	0.376 a	0.229 a
CA condition	0%CO2 + 21%O2	0.267 e	0.237 e	0.138 e
	0%CO2 + 2%O2	0.167 e	0.217 e	0.150 e
	0%CO2 + 1%O2	0.313 e	0.219 e	0.129 e
	0%CO2 + 0.5%O2	0.197 e	0.162 e	0.133 e
Pretreatment	none	0.225 p	0.188 p	0.119 p
	Chlorine	0.241 p	0.233 p	0.150 p
	water	0.197 p	0.206 p	0.144 p

Score 0 -3; averages with the same character are not significantly different ($p<5\%$). Do not compare averages in different columns.

Waterstain is only influenced by the colour of the fruits. The yellow fruits show a constant higher score for this parameter than the red fruits. Neither pretreatments nor CA conditions show any influence on waterstain.

4.2.7 Weight loss

Results of the statistical analysis of the data are presented in table 19.

Table 19: Average weight losses* of red and yellow bell peppers stored at 1°C in low oxygen contents during 2 and 3 weeks.

	Condition	Weight loss (%)
Colour	red	3.38 a
	yellow	2.85 b
CA condition	0%CO2 + 21%O2	3.40 e
	0%CO2 + 2%O2	3.16 e
	0%CO2 + 1%O2	2.95 e
	0%CO2 + 0.5%O2	2.97 e
Pretreatment	none	2.87 p
	chlorine	2.97 p
	water	3.51 q
Storage time	14 days	2.33 x
	21 days	3.91 y

Averages with the same character are not significantly different.

It was quite clear from the analysis of variance, that red bell peppers showed significant lower weight loss than yellow fruits. CA conditions did not influence weight loss, but 3 weeks caused higher losses than 2 weeks. A pretreatment with water caused significant higher weight losses than a washing with chlorinated water or no treatment. This effect is not understood.

4.2.8 Respiration Activity

The results of the respiration measurement are shown in the figures 5 and 6. Both figures clearly illustrate, that hardly any difference could be observed among the tested CA conditions. The lowest oxygen concentration showed the highest respiration activity for red bell peppers. This is what was expected from a general concept of the influence of lowering oxygen content on Respiration activity. 0.1%O2 will increase CO_2 production due to fermentation. On the other hand: the other oxygen concentrations are hardly different among each other.
The yellow bell peppers are not very influenced by changes in oxygen content.

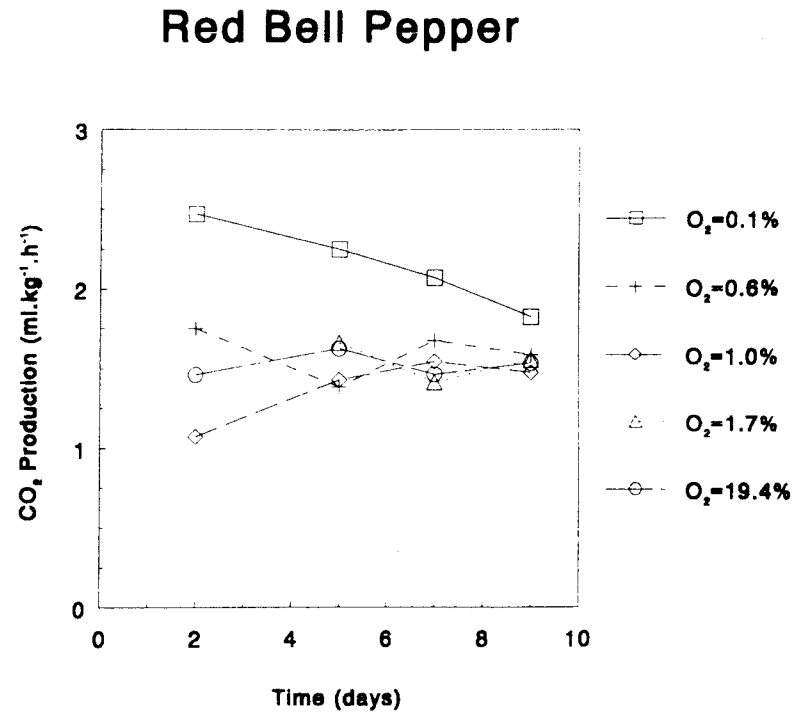

Fig 5: Influence of oxygen content on respiration activity of red bell peppers stored at 1°C.

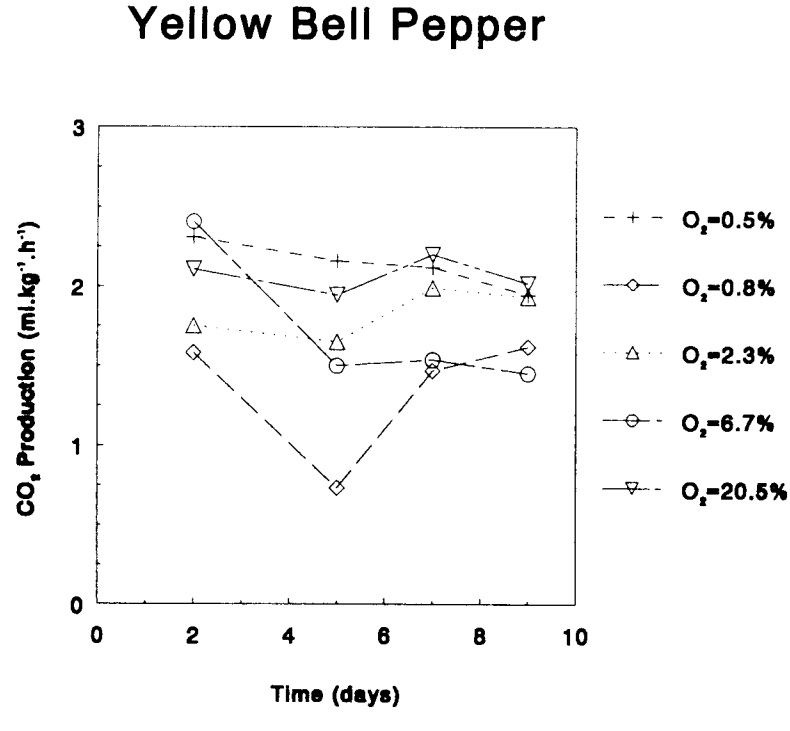

Fig 6: Influence of the oxygen content on respiration activity of yellow bell peppers stored at 1°C.

4.2.9 Discussion experiment 2

A similar evaluation (see 3.1.13) of the results of the second experiment is shown in table 20. Low oxygen contents are compared with air storage and the pretreatments are compared with no treatment.

Table 20: Influence of pretreatments and low oxygen content on quality aspects of bell peppers.

		Quality aspects					
		ACC*	LTB*	SOF*	STD*	FRD*	WST*
2%O2	14	+	.	.	.	.	.
	14+4	.	-	.	.	.	.
	14+4+3	.	.	.	-	.	.
1%O2	14	.	.	.	.	.	.
	14+3	-	-	.	.	.	.
	14+4+3	.	-	.	-	.	.
0.5%O2	14	+	.	.	.	.	.
	14+4	-	-	-	.	.	.
	14+4+3	.	-	.	-	.	.
Chlorinated	14	+	.	.	+	+	.
water	14+4	+	.	.	+	+	.
	14+4+3	+	.	+	+	+	.
Water	14	+	.	.	+	+	.
	14+4	+	-	.	+	+	.
	14+4+3	.	.	.	.	+	.

* * see table 12

2% oxygen was only positive concerning acceptability after 14 days. No influence could be observed for the rest of the parameters after 14 days. This picture turns into one negative influence on stem decay and further no influence on any quality aspect. The positive effect of 2% O2 does not persist. 1%O2 shows a lot of "no effects", but also some negative effects on keepability aspects. Especially pitting (low temperature breakdown and/or low oxygen damage) caused serious problems. The same picture was found for 0.5% oxygen, although a positive effect on acceptability was observed after 14 days.

The effect of the pretreaments is quite clear. Dipping the fruits in water and removing this water with tissues has a positive influence on the quality aspects stem (after 14 and 18 days) and fruit decay (after any storage duration). These effects are also reflected in the acceptability assessments after 14 and 18 days. Dipping bell pepper fruits in chlorinated water has a stronger effect on the same keepability aspects as dipping in water. These effects are reflected in acceptability after any storage duration.

Conclusions:
1. Washing bell peppers before storage promotes keepability of the fruits and this effect is stronger and more persistent if some chlorine is added to the water.
2. Very low oxygen conditions are dangerous for bell peppers. Heavy pitting may occur.

4.3 Experiment 3

The complete set of the raw data is added to this report as annexe 3.
Statistical analysis was possible, if the different storage durations were used as replicates. The results of the third experiment are presented in table 21.

Table 21: Influence of colour and CA conditions on different quality parameters of red and yellow bell peppers stored at 1°C.

		ACC	LTB	SOFT	STD	FRD	WST
Colour	Yellow	0.91 a	0.47 a	0.21 a	0.63 a	0.31 a	0.09 a
	Red	0.72 a	0.30 a	0.20 a	0.47 a	0.35 a	0.02 b
CA	0%CO2+21%O2	0.56 e	0.22 e	0.09 f	0.28 e	0.22 e	0.08 e
	0%CO2+2%O2	0.57 e	0.14 e	0.09 f	0.39 e	0.35 e	0.07 e
	10%CO2+2%O2	0.77 e	0.36 e	0.02 f	0.54 e	0.30 e	0.06 e
	20%CO2+2%O2	0.89 e	0.46 e	0.27 f	0.72 e	0.31 e	0.03 e
	0%CO2+1%O2	0.70 e	0.47 e	0.07 f	0.38 e	0.28 e	0.02 e
	10%CO2+1%O2	0.84 e	0.33 e	0.06 f	0.48 e	0.31 e	0.08 e
	20%CO2+1%O2	0.98 e	0.67 e	0.12 f	0.68 e	0.33 e	0.08 e

Scores 0-3; averages with the same character are not significantly different; do not compare between columns.

Only a very few differences were significant. Colour differences were found only for waterstain. The yellow fruits show more waterstain than the red fruits. Differences among the CA conditions were not significant.
If a calculation is done only on the three CO2 contents a significant difference was found. 20%CO2 showed higher scores for softness in comparison with 10%CO2 and 0%CO2. In 20%CO2 more firmness loss was established.

5. Discussion

Dutch bell peppers are transported to the United States by air. The costs of this method are high and therefore TRANSFRESH CORPORATION was looking for alternatives and asked ATO-DLO to perform research on low temperature, CA conditions and (pre)treatments, which could improve keepability of green, orange, yellow and red bell peppers. If keepability should be increased to a certain extent by a lower temperature than the recommended 7-8°C and/or CA conditions and/or (pre)treatments to a certain extent, sea transport in CA containers could be possible.
It must be concluded from the research that keepability is not improved by storage at 1°C. On the contrary, it is dangerous to apply this temperature. Especially green bell peppers suffered from typical low temperature breakdown (pitting). Although orange, yellow and red fruits showed hardly any pitting, they suffered on the other hand of adverse effects on several other quality characteristics. Although positive effects were observed after 2 weeks, these effects disappeared or turned into negative effects after prolonged storage at a higher temperature.
These effects were also observed in 1986 (Schouten & Stork, 1986). Typical low temperature breakdown symptoms were absent for red fruits, but nevertheless an increase in decay was observed. Another important point in that research was, that LTB and other quality aspects proved to be dependent on the origin (grower) of the fruits.

The tested CA conditions (0%CO2 + 3%O2, 5%CO2 + 3%O2 and 10%CO2 + 3%O2) showed the same tendency as lowering the temperature from 8 to 1°C. Positive effects were seen after 2 weeks, but these effects were not persistent or turned into negative effects. Low oxygen conditions below 2% were very dangerous to bell peppers, since low oxygen damage was observed for red and yellow fruits. It has not become quite clear, if an increase in carbon dioxide content will improve keepability, since we performed the test at too low oxygen contents. It may be, according to an international recommendation (Saltveit, 1993), that high CO2 at higher oxygen contents improves quality of bell peppers. The results concerning CA conditions are somewhat contradictory to the mentioned recommendation, although it is not too optimistic about the possibilities of low oxygen contents.

It appeared that pretreatments may have a positive effect on keepability by decreasing decay symptoms. Dipping the fruits in water (and in this way cleaning the surface of the fruits from dirt) and drying them, suppressed development of decay on the fruit surface and on the stem. This effect became still stronger and more persistent, if some chlorine was dissolved in the water.
Dipping only the stems in chlorinated water or in a benomyl solution also showed a decrease in stem decay.

It must be concluded, that a decrease in temperature to 1°C or the application of CA conditions (with a possible exception for high carbon dioxide contents at relatively high oxygen contents) may have adverse effects on keepability of bell pepper fruits and are therefore not recommended.
Careful cleaning the fruits with (chlorinated) water improved keepability and could be recommended, if the law does allow this application.

A serious problem in the performed research was the number of fruits, which were still acceptable. The percentage of these fruits was very low at the end of the total

storage period. The percentages "Zero's" (still acceptable) were in most cases much lower than 50% in experiment 1. This was further illustrated at the end of the experiment. Two weeks younger fruits showed a much better appaerance and less decay than the fruits of experiment 1. The best storage conditions in experiment 2 (storage in air and pretreated with chlorinated water) did not show higher percentages than about 60% (yellow fruits) and 40%(red fruits) of acceptable fruits at the end of the total storage duration. This means, that too many fruits were not acceptable at the end of the storage period.

The final general conclusion from the research is, that it is not possible to transport Dutch grown bell peppers over sea during 2 weeks, taking into account, that after the two weeks it still takes some days to get through distribution channels followed by some days at high temperatures to sell the fruits. This conclusion agrees with earlier research (Schouten & Stork, 1984). Bell peppers were transported by boat from the Canarian islands to Holland. After the assessments on the Canarian islands and in Rotterdam, we stored the fruits at higher temperatures for some days. We observed a quick deterioration of fruit quality as a very quick rise in (stem) decay. A hopeful aspect of the research from 1984 was the enormous difference in origins: stem decay varied from 0 to 78%.
The final general conclusion could therefore be wrong, if it were possible to select growers with the best keepable bell peppers. This asks however for a very good parameter to predict keepability of bell peppers.

6. Conclusion

Decrease of the storage temperature to 1°C and/or application of CA conditions do not promote keepability of Dutch grown bell peppers. Careful washing with (preferably chlorinated), water contributes to a better keepability of the fruits.

A replacement of air transport by overseas transport during 2 weeks, taking into account a sufficient quality level after an additional week at higher temperatures is not possible for Dutch grown bell peppers. This final conclusion could perhaps only need correction, if it were possible to select growers with extremely well keepable fruits.

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TRANSFRESH BELL PEPPER STORAGE RESEARCH 1995 ANNEXE 1.1
Parameter: Acceptability

Assessments:			14 days					14 + 4 days					14 + 4 + 3 days				
Colour	Temp.		Acceptability				Calc.	Acceptability				Calc.	Acceptability				Calc.
		Cont/cond	0	1	2	3		0	1	2	3		0	1	2	3	
Green	1	41/0-21	3	17	0	0	0.85	0	20	0	0	1	0	6	0	14	2.4
		46/0-21	17	3	0	0	0.15	0	20	0	0	1	0	2	6	12	2.5
		44/0-3	18	2	0	0	0.1	0	20	0	0	1	0	6	7	7	2.05
		47/0-3	12	8	0	0	0.4	0	20	0	0	1	0	0	6	14	2.7
		43/5-3	16	4	0	0	0.2	0	20	0	0	1	0	0	19	1	2.05
		45/5-3	2	18	0	0	0.9	2	18	0	0	0.9	0	1	10	9	2.4
		42/10-3	14	5	1	0	0.35	0	20	0	0	1	0	0	3	17	2.85
		48/10-3	17	3	0	0	0.15	1	19	0	0	0.95	0	0	5	15	2.75
green	8	51/0-21	9	9	2	0	0.65	2	18	0	0	0.9	4	5	8	3	1.5
		53/0-21	9	11	0	0	0.55	5	15	0	0	0.75	10	6	0	4	0.9
		52/0-3	13	7	0	0	0.35	0	20	0	0	1	0	10	6	4	1.7
		56/0-3	14	6	0	0	0.3	6	14	0	0	0.7	2	11	7	0	1.25
		50/5-3	13	7	0	0	0.35	0	20	0	0	1	1	16	3	0	1.1
		55/5-3	15	5	0	0	0.25	0	20	0	0	1	0	19	0	1	1.1
		49/10-3	19	1	0	0	0.05	3	17	0	0	0.85	0	12	4	4	1.6
		54/10-3	20	0	0	0	0	1	19	0	0	0.95	0	6	0	14	2.4
orange	1	41/0-21	3	14	3	0	1	4	16	0	0	0.8	1	7	5	7	1.9
		46/0-21	7	11	0	2	0.85	4	16	0	0	0.8	5	7	6	2	1.25
		44/0-3	6	9	5	0	0.95	2	18	0	0	0.9	6	4	4	6	1.5
		47/0-3	7	12	0	1	0.75	3	17	0	0	0.85	6	9	5	0	0.95
		43/5-3	5	8	0	7	1.45	3	17	0	0	0.85	0	18	0	2	1.2
		45/5-3	7	10	3	0	0.8	3	17	0	0	0.85	2	12	0	6	1.5
		42/10-3	7	10	3	0	0.8	6	14	0	0	0.7	3	7	3	7	1.7
		48/10-3	8	10	2	0	0.7	5	15	0	0	0.75	1	15	1	3	1.3
orange	8	51/0-21	2	12	6	0	1.2	3	17	0	0	0.85	0	15	0	5	1.5
		53/0-21	1	15	4	0	1.15	1	19	0	0	0.95	2	10	0	8	1.7
		52/0-3	8	7	5	0	0.85	6	14	0	0	0.7	2	8	2	8	1.8
		56/0-3	3	17	0	0	0.85	3	17	0	0	0.85	4	7	4	5	1.5
		50/5-3	8	5	5	2	1.05	5	15	0	0	0.75	3	8	2	7	1.65
		55/5-3	4	8	7	1	1.25	3	17	0	0	0.85	5	9	0	6	1.35
		49/10-3	3	13	4	0	1.05	1	19	0	0	0.95	0	3	9	8	2.25
		54/10-3	3	6	6	5	1.65	4	16	0	0	0.8	6	6	5	2	1.16
yellow	1	41/0-21	19	1	0	0	0.05	19	1	0	0	0.05	4	16	0	0	0.8
		46/0-21	20	0	0	0	0	14	6	0	0	0.3	7	11	0	2	0.85
		44/0-3	18	2	0	0	0.1	18	2	0	0	0.1	10	4	0	6	1.1
		47/0-3	20	0	0	0	0	16	4	0	0	0.2	8	6	0	6	1.2
		43/5-3	20	0	0	0	0	17	3	0	0	0.15	7	10	0	3	0.95
		45/5-3	18	2	0	0	0.1	10	10	0	0	0.5	4	9	0	7	1.5
		42/10-3	20	0	0	0	0	16	4	0	0	0.2	1	12	0	7	1.65
		48/10-3	18	2	0	0	0.1	13	7	0	0	0.35	5	9	0	6	1.35
yellow	8	51/0-21	15	5	0	0	0.25	9	11	0	0	0.55	6	6	0	8	1.5
		53/0-21	16	4	0	0	0.2	16	4	0	0	0.2	11	0	0	9	1.35
		52/0-3	19	1	0	0	0.05	16	4	0	0	0.2	17	3	0	0	0.15
		56/0-3	19	1	0	0	0.05	16	4	0	0	0.2	6	6	3	5	1.35
		50/5-3	20	0	0	0	0	14	6	0	0	0.3	2	5	0	13	2.2
		55/5-3	17	3	0	0	0.15	17	3	0	0	0.15	12	0	0	8	1.2
		49/10-3	16	4	0	0	0.2	10	10	0	0	0.5	8	2	10	0	1.1
		54/10-3	19	1	0	0	0.05	11	9	0	0	0.45	6	3	0	11	1.8
red	1	41/0-21	15	5	0	0	0.25	5	15	0	0	0.75	0	20	0	0	1
		46/0-21	16	4	0	0	0.2	13	6	1	0	0.4	0	19	0	1	1.1
		44/0-3	19	1	0	0	0.05	9	11	0	0	0.55	0	20	0	0	1
		47/0-3	20	0	0	0	0	15	5	0	0	0.25	0	20	0	0	1
		43/5-3	20	0	0	0	0	9	11	0	0	0.55	0	19	0	1	1.1
		45/5-3	20	0	0	0	0	13	7	0	0	0.35	0	19	0	1	1.1
		42/10-3	20	0	0	0	0	8	12	0	0	0.6	0	20	0	0	1
		48/10-3	20	0	0	0	0	6	13	1	0	0.75	19	1	0	0	0.05
red	8	51/0-21	4	14	2	0	0.9	3	17	0	0	0.85	2	16	1	1	1.05
		53/0-21	7	11	2	0	0.75	6	14	0	0	0.7	6	12	0	2	0.9
		52/0-3	7	10	3	0	0.8	4	14	2	0	0.9	7	13	0	0	0.65
		56/0-3	8	11	1	0	0.65	7	13	0	0	0.65	6	13	0	1	0.8
		50/5-3	6	13	1	0	0.75	9	11	0	0	0.55	3	15	2	0	0.95
		55/5-3	11	9	0	0	0.45	3	15	0	0	0.83	0	12	6	0	1.33
		49/10-3	14	6	0	0	0.3	9	11	0	0	0.55	1	18	0	1	1.05
		54/10-3	14	6	0	0	0.3	10	10	0	0	0.5	1	19	0	0	0.95

TRANSFRESH BELL PEPPER STORAGE RESEARCH 1995 ANNEXE 1.2
Parameter: low temperature breakdown

Assessments:			14 days					14 + 4 days					14 + 4 + 3 days				
Colour	Temp	Cont/cond	LTB				Calc.	LTB				Calc.	LTB				Calc.
			0	1	2	3		0	1	2	3		0	1	2	3	
green	1	41/0-21	5	15	0	0	0.75	4	16	0	0	0.8	2	18	0	0	0.9
		46/0-21	20	0	0	0	0	4	16	0	0	0.8	17	3	0	0	0.15
		44/0-3	20	0	0	0	0	4	16	0	0	0.8	1	19	0	0	0.95
		47/0-3	13	7	0	0	0.35	6	14	0	0	0.7	0	20	0	0	1
		43/5-3	17	3	0	0	0.15	0	20	0	0	1	0	20	0	0	1
		45/5-3	6	14	0	0	0.7	6	14	0	0	0.7	0	20	0	0	1
		42/10-3	15	5	0	0	0.25	4	16	0	0	0.8	0	20	0	0	1
		48/10-3	20	0	0	0	0	4	16	0	0	0.8	0	20	0	0	1
green	8	51/0-21	20	0	0	0	0	19	1	0	0	0.05	16	4	0	0	0.2
		53/0-21	20	0	0	0	0	18	2	0	0	0.1	16	4	0	0	0.2
		52/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		56/0-3	20	0	0	0	0	19	1	0	0	0.05	19	1	0	0	0.05
		50/5-3	20	0	0	0	0	20	0	0	0	0	17	3	0	0	0.15
		55/5-3	20	0	0	0	0	15	4	1	0	0.3	13	7	1	0	0.43
		49/10-3	20	0	0	0	0	19	1	0	0	0.05	17	3	0	0	0.15
		54/10-3	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
orange	1	41/0-21	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		46/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		44/0-3	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
		47/0-3	20	0	0	0	0	19	1	0	0	0.05	18	2	0	0	0.1
		43/5-3	20	0	0	0	0	20	0	0	0	0	13	7	0	0	0.35
		45/5-3	20	0	0	0	0	19	1	0	0	0.05	15	5	0	0	0.25
		42/10-3	20	0	0	0	0	20	0	0	0	0	7	13	0	0	0.65
		48/10-3	20	0	0	0	0	20	0	0	0	0	4	16	0	0	0.8
orange	8	51/0-21	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		53/0-21	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		52/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		56/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		50/5-3	19	1	0	0	0.05	19	1	0	0	0.05	20	0	0	0	0
		55/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		49/10-3	20	0	0	0	0	14	6	0	0	0.3	14	6	0	0	0.3
		54/10-3	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
yellow	1	41/0-21	20	0	0	0	0	19	1	0	0	0.05	19	1	0	0	0.05
		46/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		44/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		47/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		43/5-3	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		45/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		42/10-3	20	0	0	0	0	18	2	0	0	0.1	17	3	0	0	0.15
		48/10-3	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
yellow	8	51/0-21	20	0	0	0	0	18	2	0	0	0.1	20	0	0	0	0
		53/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		52/0-3	20	0	0	0	0	18	2	0	0	0.1	20	0	0	0	0
		56/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		50/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		55/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		49/10-3	20	0	0	0	0	15	5	0	0	0.25	19	1	0	0	0.05
		54/10-3	20	0	0	0	0	18	2	0	0	0.1	19	1	0	0	0.05
red	1	41/0-21	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		46/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		44/0-3	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		47/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		43/5-3	20	0	0	0	0	19	1	0	0	0.05	13	7	0	0	0.35
		45/5-3	20	0	0	0	0	20	0	0	0	0	15	5	0	0	0.25
		42/10-3	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
		48/10-3	20	0	0	0	0	20	0	0	0	0	11	9	0	0	0.45
red	8	51/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		53/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		52/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		56/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		50/5-3	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		55/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		49/10-3	19	1	0	0	0.05	19	1	0	0	0.05	20	0	0	0	0
		54/10-3	20	0	0	0	0	20	0	0	0	0	16	4	0	0	0.2

TRANSFRESH BELL PEPPER STORAGE RESEARCH 1995 ANNEXE 1.3
Parameter: softness

Assessments:			14 days					14 + 4 days					14 + 4 + 3 days				
Colour	Temp	Cont/cond	Softness				Calc.	Softness				Calc.	Softness				Calc.
			0	1	2	3		0	1	2	3		0	1	2	3	
green	1	41/0-21	20	0	0	0	0	19	1	0	0	0.05	18	2	0	0	0.1
		46/0-21	20	0	0	0	0	17	3	0	0	0.15	17	3	0	0	0.15
		44/0-3	20	0	1	0	0.1	20	0	1	0	0.1	19	1	1	0	0.14
		47/0-3	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
		43/5-3	20	0	0	0	0	17	3	0	0	0.15	16	4	0	0	0.2
		45/5-3	20	0	0	0	0	12	8	0	0	0.4	10	9	1	0	0.55
		42/10-3	19	1	0	0	0.05	9	11	0	0	0.55	5	8	6	0	1.05
		48/10-3	17	3	0	0	0.15	10	10	0	0	0.5	5	5	10	0	1.25
green	8	51/0-21	20	0	0	0	0	19	1	0	0	0.05	17	2	1	0	0.2
		53/0-21	20	0	0	0	0	20	0	0	0	0	16	4	0	0	0.2
		52/0-3	20	0	0	0	0	18	2	0	0	0.1	20	0	0	0	0
		56/0-3	20	0	0	0	0	19	1	0	0	0.05	19	1	0	0	0.05
		50/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		55/5-3	20	0	0	0	0	15	2	3	0	0.4	17	3	0	0	0.15
		49/10-3	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		54/10-3	20	0	0	0	0	13	6	1	0	0.4	19	1	1	0	0.14
orange	1	41/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		46/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		44/0-3	19	1	0	0	0.05	20	0	0	0	0	18	2	0	0	0.1
		47/0-3	20	0	0	0	0	19	1	0	0	0.05	19	1	0	0	0.05
		43/5-3	19	1	0	0	0.05	20	0	0	0	0	20	0	0	0	0
		45/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		42/10-3	20	0	0	0	0	19	1	0	0	0.05	19	1	0	0	0.05
		48/10-3	19	1	0	0	0.05	20	0	0	0	0	19	1	0	0	0.05
orange	8	51/0-21	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		53/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		52/0-3	18	1	1	0	0.15	18	1	1	0	0.15	18	2	0	0	0.1
		56/0-3	19	1	0	0	0.05	19	1	0	0	0.05	19	1	0	0	0.05
		50/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		55/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		49/10-3	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
		54/10-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
yellow	1	41/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		46/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		44/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		47/0-3	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		43/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		45/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		42/10-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		48/10-3	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
yellow	8	51/0-21	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		53/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		52/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		56/0-3	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		50/5-3	20	0	0	20	1.5	19	0	0	1	0.15	19	0	0	1	0.15
		55/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		49/10-3	18	2	0	0	0.1	19	1	0	0	0.05	18	2	0	0	0.1
		54/10-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
red	1	41/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		46/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		44/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		47/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		43/5-3	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
		45/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		42/10-3	19	1	0	0	0.05	18	2	0	0	0.1	20	0	0	0	0
		48/10-3	19	1	0	0	0.05	20				0	19	1	0	0	0.05
red	8	51/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		53/0-21	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		52/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		56/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		50/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		55/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		49/10-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		54/10-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0

TRANSFRESH BELL PEPPER STORAGE RESEARCH 1995 ANNEXE 1.4

Parameter stem decay

Assessments;			14 days					14 + 4 days					14 + 4 + 3 days				
Colour	temp	Cont/cond	Stem decay				Calc.	Stem decay				Calc.	Stem decay				Calc.
			0	1	2	3		0	1	2	3		0	1	2	3	
green	1	41/0-21	20	0	0	0	0	13	7	0	0	0.35	0	0	9	11	2.55
		46/0-21	17	3	0	0	0.15	12	8	0	0	0.4	0	5	10	5	2
		44/0-3	19	0	1	0	0.1	13	7	0	0	0.35	0	4	9	7	2.15
		47/0-3	19	1	0	0	0.05	17	3	0	0	0.15	0	4	11	5	2.05
		43/5-3	19	1	0	0	0.05	15	5	0	0	0.25	0	3	6	11	2.4
		45/5-3	20	0	0	0	0	15	5	0	0	0.25	0	5	7	8	2.15
		42/10-3	20	0	0	0	0	18	2	0	0	0.1	0	2	3	15	2.65
		48/10-3	20	0	0	0	0	16	4	0	0	0.2	0	0	6	14	2.7
green	8	51/0-21	15	3	1	1	0.4	13	6	1	1	0.52	5	12	1	2	1
		53/0-21	13	7	0	0	0.35	16	4	0	0	0.2	11	6	0	3	0.75
		52/0-3	15	4	1	0	0.3	17	3	1	0	0.24	1	17	0	2	1.15
		56/0-3	14	6	0	0	0.3	15	5	0	0	0.25	6	9	2	3	1.1
		50/5-3	13	7	0	0	0.35	14	6	0	0	0.3	2	12	3	3	1.35
		55/5-3	18	2	0	0	0.1	18	2	0	0	0.1	1	17	2	0	1.05
		49/10-3	20	0	0	0	0	14	6	0	0	0.3	1	3	9	7	2.1
		54/10-3	19	1	0	0	0.05	19	1	0	0	0.05	0	7	8	5	1.9
orange	1	41/0-21	17	3	0	0	0.15	18	2	0	0	0.1	19	1	0	0	0.05
		46/0-21	20	0	0	0	0	20	0	0	0	0	17	3	0	0	0.15
		44/0-3	20	0	0	0	0	20	0	0	0	0	17	3	0	0	0.15
		47/0-3	20	0	0	0	0	20	0	0	0	0	17	3	0	0	0.15
		43/5-3	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
		45/5-3	20	0	0	0	0	20	0	0	0	0	15	5	0	0	0.25
		42/10-3	20	0	0	0	0	20	0	0	0	0	14	6	0	0	0.3
		48/10-3	20	0	0	0	0	19	1	0	0	0.05	14	6	0	0	0.3
orange	8	51/0-21	18	2	0	0	0.1	20	0	0	0	0	17	3	0	0	0.15
		53/0-21	20	0	0	0	0	20	0	0	0	0	18	1	0	1	0.2
		52/0-3	16	4	0	0	0.2	20	0	0	0	0	15	1	0	4	0.65
		56/0-3	18	2	0	0	0.1	20	0	0	0	0	15	5	0	0	0.25
		50/5-3	20	0	0	0	0	20	0	0	0	0	12	8	0	0	0.4
		55/5-3	19	1	0	0	0.05	20	0	0	0	0	16	4	0	0	0.2
		49/10-3	20	0	0	0	0	20	0	0	0	0	13	5	2	0	0.45
		54/10-3	20	0	0	0	0	20	0	0	0	0	14	5	1	0	0.35
yellow	1	41/0-21	20	0	0	0	0	20	0	0	0	0	6	14	0	0	0.7
		46/0-21	20	0	0	0	0	20	0	0	0	0	16	2	2	0	0.3
		44/0-3	20	0	0	0	0	20	0	0	0	0	15	5	0	0	0.25
		47/0-3	20	0	0	0	0	19	1	0	0	0.05	14	5	1	0	0.35
		43/5-3	20	0	0	0	0	20	0	0	0	0	13	7	0	0	0.35
		45/5-3	20	0	0	0	0	12	8	0	0	0.4	4	16	0	0	0.8
		42/10-3	20	0	0	0	0	17	3	0	0	0.15	12	8	0	0	0.4
		48/10-3	20	0	0	0	0	19	1	0	0	0.05	7	12	0	1	0.75
yellow	8	51/0-21	20	0	0	0	0	19	1	0	0	0.05	17	1	1	1	0.3
		53/0-21	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
		52/0-3	19	1	0	0	0.05	19	1	0	0	0.05	17	3	0	0	0.15
		56/0-3	20	0	0	0	0	20	0	0	0	0	15	4	0	1	0.35
		50/5-3	20	0	0	0	0	19	0	0	1	0.15	7	9	0	4	1.05
		55/5-3	19	1	0	0	0.05	19	1	0	0	0.05	16	4	0	0	0.2
		49/10-3	20	0	0	0	0	20	0	0	0	0	12	5	3	0	0.55
		54/10-3	20	0	0	0	0	20	0	0	0	0	15	5	0	0	0.25
red	1	41/0-21	20	0	0	0	0	8	12	0	0	0.6	1	19	0	0	0.95
		46/0-21	20	0	0	0	0	1	19	0	0	0.95	0	5	12	3	1.9
		44/0-3	20	0	0	0	0	13	7	0	0	0.35	0	19	1	0	1.05
		47/0-3	20	0	0	0	0	11	9	0	0	0.45	0	20	0	0	1
		43/5-3	19	1	0	0	0.05	14	6	0	0	0.3	0	20	0	0	1
		45/5-3	20	0	0	0	0	17	3	0	0	0.15	0	9	8	4	1.76
		42/10-3	20	0	0	0	0	14	6	0	0	0.3	0	14	6	0	1.3
		48/10-3	19	1	0	0	0.05	12	8	0	0	0.4	0	7	6	7	2
red	8	51/0-21	17	3	0	0	0.15	19	1	0	0	0.05	17	2	1	0	0.2
		53/0-21	19	1	0	0	0.05	17	3	0	0	0.15	10	10	0	0	0.5
		52/0-3	16	4	0	0	0.2	15	5	0	0	0.25	9	8	3	0	0.7
		56/0-3	19	1	0	0	0.05	18	2	0	0	0.1	11	8	1	0	0.5
		50/5-3	17	3	0	0	0.15	16	4	0	0	0.2	8	10	2	0	0.7
		55/5-3	17	3	0	0	0.15	14	6	0	0	0.3	1	10	4	3	1.5
		49/10-3	17	3	0	0	0.15	13	7	0	0	0.35	3	12	5	0	1.1
		54/10-3	19	1	0	0	0.05	11	9	0	0	0.45	0	6	6	8	2.1

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Parameter fruit decay

Assessments			14 days					14+4 days					14+4+3 days				
Colour	temp	Cont/cond	Fruit decay				Calc.	fruit decay				Calc.	Fruit decay				Calc.
			0	1	2	3		0	1	2	3		0	1	2	3	
green	1	41/0-21	20	0	0	0	0	18	2	0	0	0.1	6	0	0	14	2.1
		46/0-21	20	0	0	0	0	19	1	0	0	0.05	8	0	0	12	1.8
		44/0-3	19	0	1	0	0.1	18	1	1	0	0.15	14	4	2	0	0.4
		47/0-3	20	0	0	0	0	19	1	0	0	0.05	14	0	0	6	0.9
		43/5-3	20	0	0	0	0	12	8	0	0	0.4	18	0	0	2	0.3
		45/5-3	18	2	0	0	0.1	15	5	0	0	0.25	18	1	1	0	0.15
		42/10-3	20	0	0	0	0	20	0	0	0	0	17	0	0	3	0.45
		48/10-3	20	0	0	0	0	18	2	0	0	0.1	17	0	1	2	0.4
green	8	51/0-21	11	8	1	0	0.5	13	4	1	2	0.6	18	0	0	2	0.3
		53/0-21	15	5	0	0	0.25	17	3	0	0	0.15	18	2	0	0	0.1
		52/0-3	18	2	0	0	0.1	15	5	0	0	0.25	18	0	0	2	0.3
		56/0-3	19	1	0	0	0.05	19	1	0	0	0.05	20	0	0	0	0
		50/5-3	20	0	0	0	0	18	2	0	0	0.1	18	0	0	2	0.3
		55/5-3	19	1	0	0	0.05	19	1	0	0	0.05	19	0	0	1	0.15
		49/10-3	19	1	0	0	0.05	16	4	0	0	0.2	16	0	0	4	0.6
		54/10-3	20	0	0	0	0	18	2	0	0	0.1	13	0	0	7	1.05
orange	1	41/0-21	20	0	0	0	0	20	0	0	0	0	16	0	0	4	0.6
		46/0-21	20	0	0	0	0	20	0	0	0	0	19	0	0	1	0.15
		44/0-3	20	0	0	0	0	19	1	0	0	0.05	18	2	0	0	0.1
		47/0-3	20	0	0	0	0	20	0	0	0	0	18	0	0	2	0.3
		43/5-3	20	0	0	0	0	19	1	0	0	0.05	18	0	0	2	0.3
		45/5-3	20	0	0	0	0	20	0	0	0	0	15	0	0	5	0.75
		42/10-3	20	0	0	0	0	20	0	0	0	0	13	0	0	7	1.05
		48/10-3	20	0	0	0	0	20	0	0	0	0	19	0	0	1	0.15
orange	8	51/0-21	20	0	0	0	0	20	0	0	0	0	15	0	0	5	0.75
		53/0-21	20	0	0	0	0	20	0	0	0	0	13	0	0	7	1.05
		52/0-3	19	1	0	0	0.05	19	0	1	0	0.1	14	0	0	6	0.9
		56/0-3	20	0	0	0	0	20	0	0	0	0	15	0	0	5	0.75
		50/5-3	20	0	0	0	0	20	0	0	0	0	17	0	0	3	0.45
		55/5-3	20	0	0	0	0	20	0	0	0	0	13	0	0	7	1.05
		49/10-3	20	0	0	0	0	19	1	0	0	0.05	16	0	0	4	0.6
		54/10-3	20	0	0	0	0	20	0	0	0	0	0	0	4	0	2
yellow	1	41/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		46/0-21	20	0	0	0	0	20	0	0	0	0	18	0	0	2	0.3
		44/0-3	20	0	0	0	0	20	0	0	0	0	16	0	0	4	0.6
		47/0-3	20	0	0	0	0	19	1	0	0	0.05	0	0	6	0	2
		43/5-3	20	0	0	0	0	19	1	0	0	0.05	17	3	0	0	0.15
		45/5-3	20	0	0	0	0	20	0	0	0	0	13	0	0	7	1.05
		42/10-3	20	0	0	0	0	20	0	0	0	0	13	7	0	0	0.35
		48/10-3	20	0	0	0	0	19	1	0	0	0.05	0	0	7	0	2
yellow	8	51/0-21	17	3	0	0	0.15	20	0	0	0	0	12	0	0	8	1.2
		53/0-21	16	4	0	0	0.2	19	1	0	0	0.05	11	0	0	9	1.35
		52/0-3	20	0	0	0	0	20	0	0	0	0	19	0	0	1	0.15
		56/0-3	20	0	0	0	0	20	0	0	0	0	13	0	3	4	0.9
		50/5-3	19	1	0	0	0.05	19	0	0	1	0.15	7	1	0	12	1.85
		55/5-3	20	0	0	0	0	20	0	0	0	0	13	0	0	7	1.05
		49/10-3	20	0	0	0	0	19	1	0	0	0.05	11	0	0	9	1.35
		54/10-3	20	0	0	0	0	19	1	0	0	0.05	9	0	0	1	0.3
red	1	41/0-21	13	7	0	0	0.35	7	13	0	0	0.65	4	16	0	0	0.8
		46/0-21	14	6	0	0	0.3	13	6	1	0	0.4	10	9	0	1	0.6
		44/0-3	17	3	0	0	0.15	11	9	0	0	0.45	10	9	1	0	0.55
		47/0-3	17	3	0	0	0.15	15	5	0	0	0.25	9	11	0	0	0.55
		43/5-3	17	3	0	0	0.15	10	10	0	0	0.5	4	15	0	1	0.9
		45/5-3	19	1	0	0	0.05	13	7	0	0	0.35	4	15	0	1	0.9
		42/10-3	20	0	0	0	0	12	8	0	0	0.4	3	17	0	0	0.85
		48/10-3	19	1	0	0	0.05	6	13	1	0	0.75	4	15	1	0	0.85
red	8	51/0-21	4	14	2	0	0.9	5	11	4	0	0.95	2	16	1	1	1.05
		53/0-21	5	13	2	0	0.85	8	8	4	0	0.8	7	11	0	2	0.85
		52/0-3	4	13	3	0	0.95	4	14	2	0	0.9	8	12	0	0	0.6
		56/0-3	5	14	1	0	0.8	7	13	1	0	0.71	7	11	0	1	0.74
		50/5-3	3	16	1	0	0.9	9	9	2	0	0.65	10	9	1	0	0.55
		55/5-3	7	13	0	0	0.65	9	11	0	0	0.55	6	12	0	0	0.67
		49/10-3	12	8	0	0	0.4	13	7	0	0	0.35	7	12	0	1	0.75
		54/10-3	15	5	0	0	0.25	12	8	0	0	0.4	8	12	0	0	0.6

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Parameter waterstain

Assessments:			14 days					14 + 4 days					14 + 4 + 3 days				
Colour	temp	Cont/cond	Waterstain				Calc.	waterstain				Calc.	Waterstain				Calc.
			0	1	2	3		0	1	2	3		0	1	2	3	
green	1	41/0-21	19	0	1	0	0.1	19	1	0	0	0.05	19	1	0	0	0.05
		46/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		44/0-3	20	0	1	0	0.1	20	0	1	0	0.1	20	0	1	0	0.1
		47/0-3	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
		43/5-3	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
		45/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		42/10-3	19	1	0	0	0.05	19	1	0	0	0.05	19	1	0	0	0.05
		48/10-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
green	8	51/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		53/0-21	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
		52/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		56/0-3	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
		50/5-3	19	1	0	0	0.05	20	0	0	0	0	20	0	0	0	0
		55/5-3	18	2	0	0	0.1	18	2	0	0	0.1	20	0	0	0	0
		49/10-3	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
		54/10-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
orange	1	41/0-21	8	5	4	3	1.1	8	6	3	3	1.05	9	4	4	3	1.05
		46/0-21	7	7	4	2	1.05	6	8	6	0	1	7	5	6	2	1.15
		44/0-3	6	4	5	5	1.45	5	7	3	5	1.4	8	3	4	5	1.3
		47/0-3	7	6	6	1	1.05	5	9	3	3	1.2	11	5	4	0	0.65
		43/5-3	5	4	4	6	1.58	6	7	3	4	1.25	4	7	5	4	1.45
		45/5-3	7	6	4	3	1.15	3	10	2	5	1.45	5	8	4	3	1.25
		42/10-3	7	8	2	3	1.05	6	9	5	0	0.95	9	8	3	0	0.7
		48/10-3	9	6	3	2	0.9	5	9	3	3	1.2	10	7	1	2	0.75
orange	8	51/0-21	1	10	3	6	1.7	4	7	5	4	1.45	0	10	6	4	1.7
		53/0-21	3	6	7	4	1.6	2	5	8	5	1.8	4	8	5	3	1.35
		52/0-3	8	5	2	5	1.2	6	9	3	2	1.05	8	8	0	4	1
		56/0-3	3	6	7	4	1.6	4	9	4	3	1.3	6	8	4	2	1.1
		50/5-3	10	3	5	2	0.95	8	8	3	1	0.85	12	5	1	2	0.65
		55/5-3	5	6	2	7	1.55	4	9	3	4	1.35	7	7	2	4	1.15
		49/10-3	3	10	3	4	1.4	7	7	5	1	1	8	5	3	4	1.15
		54/10-3	6	5	4	5	1.4	7	7	5	1	1	8	6	4	2	1
yellow	1	41/0-21	19	1	0	0	0.05	19	1	0	0	0.05	18	2	0	0	0.1
		46/0-21	20	0	0	0	0	19	1	0	0	0.05	18	2	0	0	0.1
		44/0-3	18	2	0	0	0.1	18	2	0	0	0.1	18	2	0	0	0.1
		47/0-3	20	0	0	0	0	18	2	0	0	0.1	17	3	0	0	0.15
		43/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		45/5-3	18	2	0	0	0.1	17	3	0	0	0.15	20	0	0	0	0
		42/10-3	20	0	0	0	0	17	3	0	0	0.15	19	1	0	0	0.05
		48/10-3	18	2	0	0	0.1	15	5	0	0	0.25	15	5	0	0	0.25
yellow	8	51/0-21	18	2	0	0	0.1	14	6	0	0	0.3	20	0	0	0	0
		53/0-21	20	0	0	0	0	18	2	0	0	0.1	17	3	0	0	0.15
		52/0-3	19	1	0	0	0.05	19	1	0	0	0.05	19	1	0	0	0.05
		56/0-3	19	1	0	0	0.05	18	2	0	0	0.1	16	4	0	0	0.2
		50/5-3	20	0	0	0	0	16	4	0	0	0.2	19	1	0	0	0.05
		55/5-3	18	2	0	0	0.1	18	2	0	0	0.1	17	3	0	0	0.15
		49/10-3	18	2	0	0	0.1	17	3	0	0	0.15	19	1	0	0	0.05
		54/10-3	19	1	0	0	0.05	20	0	0	0	0	19	1	0	0	0.05
red	1	41/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		46/0-21	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		44/0-3	20	0	0	0	0	18	2	0	0	0.1	20	0	0	0	0
		47/0-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		43/5-3	19	1	0	0	0.05	20	0	0	0	0	20	0	0	0	0
		45/5-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		42/10-3	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
		48/10-3	19	1	0	0	0.05	19	1	0	0	0.05	20	0	0	0	0
red	8	51/0-21	17	3	0	0	0.15	20	0	0	0	0	20	0	0	0	0
		53/0-21	19	1	0	0	0.05	20	0	0	0	0	20	0	0	0	0
		52/0-3	16	4	0	0	0.2	20	0	0	0	0	20	0	0	0	0
		56/0-3	19	1	0	0	0.05	20	0	0	0	0	20	0	0	0	0
		50/5-3	17	3	0	0	0.15	20	0	0	0	0	20	0	0	0	0
		55/5-3	17	3	0	0	0.15	18	2	0	0	0.1	18	2	0	0	0.1
		49/10-3	17	3	0	0	0.15	19	1	0	0	0.05	20	0	0	0	0
		54/10-3	19	1	0	0	0.05	19	1	0	0	0.05	20	0	0	0	0

TRANSFRESH BELL PEPPER STORAGE RESEARCH 1995

Assessments aftyer 14 days

Parameter colour of green fruits

Cont/cond	Temp	0	1	2	3	Calc.
41/0-21	1	20	0	0	0	0
46/0-21	1	20	0	0	0	0
44/0-3	1	20	0	0	0	0
47/0-3	1	20	0	0	0	0
43/5-3	1	20	0	0	0	0
45/5-3	1	20	0	0	0	0
42/10-3	1	20	0	0	0	0
48/10-3	1	20	0	0	0	0
51/0-21	8	19	1	0	0	0.05
53/0-21	8	20	0	0	0	0
52/0-3	8	20	0	0	0	0
56/0-3	8	20	0	0	0	0
50/5-3	8	20	0	0	0	0
55/5-3	8	20	0	0	0	0
49/10-3	8	20	0	0	0	0
54/10-3	8	20	0	0	0	0

Assessments after 14 + 4 days

		0	1	2	3	
41/0-21	1	20	0	0	0	0
46/0-21	1	20	0	0	0	0
44/0-3	1	19	1	0	0	0.05
47/0-3	1	20	0	0	0	0
43/5-3	1	20	0	0	0	0
45/5-3	1	20	0	0	0	0
42/10-3	1	20	0	0	0	0
48/10-3	1	20	0	0	0	0
51/0-21	8	19	1	0	0	0.05
53/0-21	8	20	0	0	0	0
52/0-3	8	18	2	0	0	0.1
56/0-3	8	20	0	0	0	0
50/5-3	8	20	0	0	0	0
55/5-3	8	20	0	0	0	0
49/10-3	8	20	0	0	0	0
54/10-3	8	20	0	0	0	0

Assessments aftyer 14 + 4 + 3 days

		0	1	2	3	
41/0-21	1	20	0	0	0	0
46/0-21	1	20	0	0	0	0
44/0-3	1	16	2	2	0	0.3
47/0-3	1	20	0	0	0	0
43/5-3	1	20	0	0	0	0
45/5-3	1	20	0	0	0	0
42/10-3	1	20	0	0	0	0
48/10-3	1	20	0	0	0	0
51/0-21	8	18	1	0	1	0.2
53/0-21	8	20	0	0	0	0
52/0-3	8	17	2	1	0	0.2
56/0-3	8	18	0	2	0	0.2
50/5-3	8	20	0	0	0	0
55/5-3	8	19	0	0	1	0.15
49/10-3	8	20	0	0	0	0
54/10-3	8	20	0	0	0	0

Assessments after 14 + 4 + 3 days

Parameter stem colour

Colour	Temp	Cont/cond	Stem colour 0	1	2	3	Calculation
green	1	41/0-21	0	0	7	13	2.65
		46/0-21	0	0	4	12	2.75
		44/0-3	0	1	8	11	2.5
		47/0-3	0	1	9	10	2.45
		43/5-3	0	4	11	5	2.05
		45/5-3	0	11	5	4	1.65
		42/10-3	0	5	12	3	1.9
		48/10-3	0	11	5	4	1.65
green	8	51/0-21	4	11	0	5	1.3
		53/0-21	11	5	0	3	0.74
		52/0-3	0	7	6	7	2
		56/0-3	1	7	3	9	2
		50/5-3	0	5	10	5	2
		55/5-3	0	4	9	7	2.15
		49/10-3	0	5	10	5	2
		54/10-3	0	3	10	7	2.2
orange	1	41/0-21	20	0	0	0	0
		46/0-21	20	0	0	0	0
		44/0-3	19	0	1	0	0.1
		47/0-3	18	1	1	0	0.15
		43/5-3	20	0	0	0	0
		45/5-3	17	3	0	0	0.15
		42/10-3	19	1	0	0	0.05
		48/10-3	20	0	0	0	0
orange	8	51/0-21	18	2	0	0	0.1
		53/0-21	20	0	0	0	0
		52/0-3	19	0	0	1	0.15
		56/0-3	20	0	0	0	0
		50/5-3	16	4	0	0	0.2
		55/5-3	19	1	0	0	0.05
		49/10-3	18	0	2	0	0.2
		54/10-3	20	0	0	0	0
yellow	1	41/0-21	16	4	0	0	0.2
		46/0-21	13	7	0	0	0.35
		44/0-3	16	4	0	0	0.2
		47/0-3	9	5	6	0	0.85
		43/5-3	16	4	0	0	0.2
		45/5-3	12	8	0	0	0.4
		42/10-3	11	7	2	0	0.55
		48/10-3	16	3	0	1	0.3
yellow	8	51/0-21	15	2	0	3	0.55
		53/0-21	17	3	0	0	0.15
		52/0-3	16	4	0	0	0.2
		56/0-3	14	2	0	2	0.44
		50/5-3	13	2	0	5	0.85
		55/5-3	18	2	0	0	0.1
		49/10-3	15	5	0	0	0.25
		54/10-3	16	4	0	0	0.2
red	1	41/0-21	17	3	0	0	0.15
		46/0-21	18	2	0	0	0.1
		44/0-3	19	1	0	0	0.05
		47/0-3	14	6	0	0	0.3
		43/5-3	11	5	4	0	0.65
		45/5-3	19	1	0	0	0.05
		42/10-3	19	1	0	0	0.05
		48/10-3	18	2	0	0	0.1
red	8	51/0-21	18	1	1	0	0.15
		53/0-21	18	1	0	1	0.2
		52/0-3	18	2	0	0	0.1
		56/0-3	19	1	0	0	0.05
		50/5-3	18	2	0	0	0.1
		55/5-3	14	6	0	0	0.3
		49/10-3	17	3	0	0	0.15
		54/10-3	14	6	0	0	0.3

TRANSFRESH BELL PEPPER STORAGE RESEARCH 1995 ANNEXE 1.8
Parameter Instron firmness

Temp and CA cond	14 days	14+4 days	14+4+3 days
	Strain (%)	Strain (%)	Strain (%)
1/0-21	5.768515	6.276914	6.225579
	5.657599	6.839445	5.451369
1/0-3	5.608132	8.010129	5.630464
	5.330927	6.125916	5.451369
1/5-3	5.872119	5.89102	6.625563
	4.83517	6.76587	7.534942
1/10-3	6.055925	5.350828	6.554402
	7.552073	6.517805	6.561722
8/0-21	6.056147	7.729753	7.346073
	5.45703	7.558884	7.029193
8/0-3	4.844228	7.576556	6.780588
	4.999072	7.887233	6.589088
8/5-3	5.193178	7.907134	6.203682
	5.49863	6.890206	6.390003
8/10-3	4.738813	6.273691	5.57482
	5.305253	5.760635	5.573595

TRANSFRESH BELL PEPPER STORAGE RESEARCH 1995 ANNEXE 1.9

Assessments:

		After 14 days				14 + 4 days				14 + 4 + 3 days						
Treatment		Acceptability				Acceptability				Acceptability						
		0	1	2	3	0	1	2	3	0	1	2	3	Calculation		
Cont.	0-21	4	14	2	0	3	17	0	0	2	16	1	1	0.9	0.85	1.05
	0-21	7	11	2	0	6	14	0	0	6	12	0	2	0.75	0.7	0.9
Chl2	0-21	7	12	1	0	4	16	0	0	9	10	0	0	0.7	0.8	0.526
	0-21	9	11	0	0	5	14	1	0	5	13	1	4	0.55	0.8	1.174
liner	0-21	7	7	2	0	2	8	6	0	0	0	0	16	0.688	1.25	3
	0-21	0	16	0	0	0	6	10	0	0	2	0	14	1	1.625	2.75
ben.	0-21	5	15	0	0	5	15	0	0	2	18	0	0	0.75	0.75	0.9
	0-21	12	5	3	0	5	15	0	0	4	5	2	9	0.55	0.75	1.8
Cont.	5-3	6	13	1	0	9	11	0	0	3	15	2	0	0.75	0.55	0.95
	5-3	11	9	0	0	4	16	0	0	0	12	6	0	0.45	0.8	1.333
Chl2	5-3	7	12	1	0	2	17	1	0	7	11	1	1	0.7	0.95	0.8
	5-3	10	10	0	0	12	8	0	0	9	11	0	0	0.5	0.4	0.55
liner	5-3	3	12	1	0	1	11	4	0	1	6	0	9	0.875	1.188	2.063
	5-3	13	2	1	0	6	8	2	0	7	1	8	0	0.25	0.75	1.063
ben.	5-3	7	13	0	0	13	7	0	0	5	14	0	1	0.65	0.35	0.85
	5-3	13	7	0	0	11	9	0	0	8	10	1	1	0.35	0.45	0.75

		ltb				ltb				ltb						
		0	1	2	3	0	1	2	3	0	1	2	3			
Cont.	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
Chl2	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
liner	0-21	16	0	0	0	16	0	0	0	15	1	0	0	0	0	0.063
	0-21	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
ben.	0-21	20	0	0	0	19	1	0	0	19	1	0	0	0	0.05	0.05
	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
Cont.	5-3	20	0	0	0	20	0	0	0	19	1	0	0	0	0	0.05
	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
Chl2	5-3	20	0	0	0	19	1	0	0	19	1	0	0	0	0.05	0.05
	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
liner	5-3	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
	5-3	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
ben.	5-3	20	0	0	0	20	0	0	0	19	1	0	0	0	0	0.05
	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0

		Softness				Softness				Softness						
		0	1	2	3	0	1	2	3	0	1	2	3			
Cont.	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	0-21	20	0	0	0	20	0	0	0	19	1	0	0	0	0	0.05
Chl2	0-21	20	0	0	0	20	0	0	0	19	1	0	0	0	0	0.05
	0-21	20	0	0	0	19	1	0	0	20	0	0	0	0	0.05	0
liner	0-21	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
	0-21	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
ben.	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
Cont.	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
Chl2	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
liner	5-3	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
	5-3	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
ben.	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0

		Stem decay				Stem decay				Stem decay						
		0	1	2	3	0	1	2	3	0	1	2	3			
Cont.	0-21	17	3	0	0	19	1	0	0	17	2	1	0	0.15	0.05	0.2
	0-21	19	1	0	0	17	3	0	0	10	10	0	0	0.05	0.15	0.5
Chl2	0-21	20	0	0	0	20	0	0	0	17	0	1	2	0	0	0.4
	0-21	20	0	0	0	20	0	0	0	18	2	0	0	0	0	0.1
liner	0-21	13	3	0	0	9	7	0	0	9	6	1	0	0.188	0.438	0.5
	0-21	12	2	2	0	12	2	2	0	10	3	3	0	0.375	0.375	0.563
ben.	0-21	17	3	0	0	19	1	0	0	19	0	1	0	0.15	0.05	0.1
	0-21	20	0	0	0	20	0	0	0	16	3	0	1	0	0	0.3
Cont.	5-3	17	3	0	0	16	4	0	0	8	10	2	0	0.15	0.2	0.7
	5-3	17	3	0	0	14	6	0	0	1	10	4	3	0.15	0.3	1.5
Chl2	5-3	20	0	0	0	20	0	0	0	17	1	1	1	0	0	0.3
	5-3	20	0	0	0	20	0	0	0	18	2	0	0	0	0	0.1
liner	5-3	14	2	0	0	11	4	1	0	6	9	0	1	0.125	0.375	0.75
	5-3	20	0	0	0	12	4	0	0	8	4	4	0	0	0.25	0.75
ben.	5-3	19	1	0	0	19	1	0	0	13	7	0	0	0.05	0.05	0.35
	5-3	18	1	1	0	18	1	1	0	9	9	1	1	0.15	0.15	0.7

TRANSFRESH STORAGE RESEARCH 1995 ANNEXE 1.10

Assessments:

Treatment		After 14 days Fruit decay				14 + 4 days Fruit decay				14 + 4 + 3 days Fruit decay				Calculation		
		0	1	2	3	0	1	2	3	0	1	2	3			
Cont.	0-21	4	14	2	0	5	11	4	0	2	16	1	1	0.9	0.95	1.05
	0-21	5	13	2	0	8	8	4	0	7	11	0	2	0.85	0.8	0.85
Chl2	0-21	4	15	1	0	4	16	0	0	9	10	0	1	0.85	0.8	0.65
	0-21	6	12	2	0	5	14	1	0	5	13	1	1	0.8	0.8	0.9
liner	0-21	5	9	2	0	2	8	6	0	0	0	0	16	0.813	1.25	3
	0-21	0	15	1	0	0	6	10	0	0	2	0	14	1.063	1.625	2.75
ben.	0-21	2	16	2	0	5	15	0	0	2	18	0	0	1	0.75	0.9
	0-21	3	14	3	0	5	10	5	0	4	5	2	9	1	1	1.8
Cont.	5-3	3	16	1	0	9	9	2	0	10	9	1	0	0.9	0.65	0.55
	5-3	7	13	0	0	9	11	0	0	6	12	0	0	0.65	0.55	0.667
Chl2	5-3	4	15	1	0	2	17	1	0	7	11	1	1	0.85	0.95	0.8
	5-3	10	10	0	0	12	8	0	0	9	11	0	0	0.5	0.4	0.55
liner	5-3	2	13	1	0	11	1	4	0	1	0	6	9	0.938	0.563	2.438
	5-3	9	6	1	0	6	8	2	0	0	7	1	8	0.5	0.75	2.063
ben.	5-3	3	17	0	0	13	5	2	0	5	14	0	1	0.85	0.45	0.85
	5-3	14	6	0	0	11	9	0	0	10	10	0	0	0.3	0.45	0.5

		Waterstain				Waterstain				Waterstain				Calculation		
		0	1	2	3	0	1	2	3	0	1	2	3			
Cont.	0-21	17	3	0	0	20	0	0	0	20	0	0	0	0.15	0	0
	0-21	19	1	0	0	20	0	0	0	20	0	0	0	0.05	0	0
Chl2	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
liner	0-21	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
	0-21	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
ben.	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	0-21	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
Cont.	5-3	17	3	0	0	20	0	0	0	20	0	0	0	0.15	0	0
	5-3	17	3	0	0	18	2	0	0	18	2	0	0	0.15	0.1	0.1
Chl2	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
liner	5-3	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
	5-3	16	0	0	0	16	0	0	0	16	0	0	0	0	0	0
ben.	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0
	5-3	20	0	0	0	20	0	0	0	20	0	0	0	0	0	0

		Stem Colour				Stem Colour
		0	1	2	3	
Cont.	0-21	18	1	1	0	0.15
	0-21	18	1	0	1	0.2
Chl2	0-21	20	0	0	0	0
	0-21	20	0	0	0	0
liner	0-21	16	0	0	0	0
	0-21	13	1	2	0	0.313
ben.	0-21	14	6	0	0	0.3
	0-21	19	0	1	0	0.1
Cont.	5-3	18	2	0	0	0.1
	5-3	14	6	0	0	0.3
Chl2	5-3	20	0	0	0	0
	5-3	17	3	0	0	0.15
liner	5-3	11	4	1	0	0.375
	5-3	12	3	1	0	0.313
ben.	5-3	20	0	0	0	0
	5-3	16	3	1	0	0.25

TRANSFRESH STORAGE RESEARCH BELL PEPPERS/2 ANNEXE 2.1

Test red en yellow fruits on low oxygen at 1C.

Pre storage treatments
none
dipping 1 minute in water, followed by drying in tissues
dipping 1 minute in 100 ppm chloride solution followed by drying in tissues

Start: 19-10-1995
Assessments: 02-11-1995 (after cold storage)
06-11-1995 (after 4 days at 8C)
09-11-1995 (after 3 days extra at 20C)

Parameter acceptability

Cont/cond		after 14 d						after 14+4					after 14+4+3 d				
		Samp	0	1	2	3	Calc	0	1	2	3	Calc	0	1	2	3	Calc
RED																	
9 0-21	con	1	8	10	2	0	0.7	3	15	0	2	1.1	0	12	3	5	1.65
	Cl	2	16	3	1	0	0.3	12	7	1	0	0.5	5	12	0	3	1.05
	water	3	15	4	1	0	0.3	11	7	1	1	0.6	6	12	0	2	0.9
14 0-21	con	31	10	10	0	0	0.5	6	12	2	0	0.8	0	11	5	4	1.65
	Cl	32	17	3	0	0	0.2	11	9	0	0	0.5	8	10	2	0	0.7
	water	33	17	3	0	0	0.2	12	7	1	0	0.5	3	11	4	2	1.25
11 0-2	con	13	10	10	0	0	0.5	3	17	0	0	0.9	2	11	5	2	1.35
	Cl	14	18	1	0	0	0.1	9	10	0	1	0.7	3	14	2	1	1.05
	water	15	17	3	0	0	0.2	8	11	0	1	0.7	0	10	5	5	1.75
13 0-2	con	25	7	13	0	0	0.7	4	14	2	0	0.9	0	7	8	5	1.9
	Cl	26	17	3	0	0	0.2	10	9	0	1	0.6	7	12	0	1	0.75
	water	27	19	1	0	0	0.1	10	10	0	0	0.5	6	10	3	1	0.95
12 0-1	con	19	7	13	0	0	0.7	4	13	2	1	1	1	8	5	6	1.8
	Cl	20	17	3	0	0	0.2	5	14	1	0	0.8	5	14	1	0	0.8
	water	21	18	2	0	0	0.1	4	15	0	1	0.9	0	18	1	1	1.15
16 0-1	con	43	12	8	0	0	0.4	4	16	0	0	0.8	0	12	4	4	1.6
	Cl	44	17	3	0	0	0.2	13	7	0	0	0.4	3	15	1	1	1
	water	45	17	3	0	0	0.2	10	10	0	0	0.5	5	13	1	1	0.9
10 0-0.5	con	7	17	3	0	0	0.2	1	19	0	0	1	14	0	5	1	0.65
	Cl	8	18	2	0	0	0.1	3	16	1	0	0.9	4	12	1	3	1.15
	water	9	16	4	0	0	0.2	15	5	0	0	0.3	0	15	4	1	1.3
15 0-0.5	con	37	16	4	0	0	0.2	1	16	2	1	1.2	0	8	6	6	1.9
	Cl	38	20	0	0	0	0	4	16	0	0	0.8	5	11	4	0	0.95
	water	39	17	3	0	0	0.2	2	16	2	0	1	1	13	5	1	1.3
YELLOW																	
9 0-21	con	4	17	2	1	0	0.2	9	7	4		0.8	4	4	5	7	1.75
	Cl	5	13	7	0	0	0.4	13	6	1		0.4	10	5	4	1	0.8
	water	6	10	10	0	0	0.5	11	9			0.5	10	7	1	2	0.75
14 0-21	con	34	12	7	1	0	0.5	7	8	2	3	1.1	0	0	7	13	2.65
	Cl	35	15	5	0	0	0.3	12	8			0.4	13	5	0	2	0.55
	water	36	13	7	0	0	0.4	11	9			0.5	0	1	13	6	2.25
11 0-2	con	16	12	8	0	0	0.4	8	9	3		0.8	0	0	13	7	2.35
	Cl	17	16	4	0	0	0.2	8	12			0.6	5	10	3	2	1.1
	water	18	13	7	0	0	0.4	10	10			0.5	0	6	8	6	2
13 0-2	con	28	14	6	0	0	0.3	12	5	3		0.6	0	4	9	7	2.15
	Cl	29	15	5	0	0	0.3	6	11	3		0.9	0	11	6	3	1.6
	water	30	20	0	0	0	0	7	8	4	1	1	0	2	8	10	2.4
12 0-1	con	22	13	7	0	0	0.4	1	14	5		1.2	0	8	10	2	1.7
	Cl	23	10	10	0	0	0.5	4	16			0.8	4	10	5	1	1.15
	water	24	13	7	0	0	0.4	5	15			0.8	0	4	9	7	2.15
16 0-1	con	46	17	3	0	0	0.2	1	13	4	2	1.4	0	1	9	10	2.45
	Cl	47	11	9	0	0	0.5	7	13			0.7	2	8	10	0	1.4
	water	48	15	5	0	0	0.3	2	16	2		1	0	0	10	10	2.5
10 0-0.5	con	10	17	3	0	0	0.2	8	10	2		0.7	10	7	1	2	0.75
	Cl	11	15	5	0	0	0.3	3	15	1	1	1	0	5	7	8	2.15
	water	12	13	7	0	0	0.4	2	16	2		1	2	11	5	2	1.35
15 0-0.5	con	40	15	5	0	0	0.3	5	12	3		0.9	0	9	6	5	1.8
	Cl	41	12	8	0	0	0.4	4	15	1		0.9	0	15	3	2	1.35
	water	42	13	7	0	0	0.4	3	13	4		1.1	0	3	11	6	2.15

TRANSFRESH STORAGE RESEARCH BELL PEPPERS/2 ANNEXE 2.1

Test red en yellow fruits on low oxygen at 1C

Pre storage treatments
no treatment
dipping 1 minute in water, followed by drying in tissues
dipping 1 minute in 100 ppm chloride solution followed by drying in tissues

Start: 19-10-1995
Assessments: 02-11-1995 (after cold storage)
06-11-1995 (after 4 days at 8C)
09-11-1995 (after 3 days extra at 20C)

Parameter acceptability

Cont/cond		after 14 d					after 14+4					after 14+4+3 d				
		Samp	0	1	2	3 Calc	0	1	2	3 Calc		0	1	2	3 Calc	
RED																
9 0-21	con	1	8	10	2	0 0.7	3	15	0	2	1.05	0	12	3	5	1.65
	Cl	2	16	3	1	0 0.25	12	7	1	0	0.45	5	12	0	3	1.05
	water	3	15	4	1	0 0.3	11	7	1	1	0.6	6	12	0	2	0.9
14 0-21	con	31	10	10	0	0 0.5	6	12	2	0	0.8	0	11	5	4	1.65
	Cl	32	17	3	0	0 0.15	11	9	0	0	0.45	8	10	2	0	0.7
	water	33	17	3	0	0 0.15	12	7	1	0	0.45	3	11	4	2	1.25
11 0-2	con	13	10	10	0	0 0.5	3	17	0	0	0.85	2	11	5	2	1.35
	Cl	14	18	1	0	0 0.053	9	10	0	1	0.65	3	14	2	1	1.05
	water	15	17	3	0	0 0.15	8	11	0	1	0.7	0	10	5	5	1.75
13 0-2	con	25	7	13	0	0 0.65	4	14	2	0	0.9	0	7	8	5	1.9
	Cl	26	17	3	0	0 0.15	10	9	0	1	0.6	7	12	0	1	0.75
	water	27	19	1	0	0 0.05	10	10	0	0	0.5	6	10	3	1	0.95
12 0-1	con	19	7	13	0	0 0.65	4	13	2	1	1	1	8	5	6	1.8
	Cl	20	17	3	0	0 0.15	5	14	1	0	0.8	5	14	1	0	0.8
	water	21	18	2	0	0 0.1	4	15	0	1	0.9	0	18	1	1	1.15
16 0-1	con	43	12	8	0	0 0.4	4	16	0	0	0.8	0	12	4	4	1.6
	Cl	44	17	3	0	0 0.15	13	7	0	0	0.35	3	15	1	1	1
	water	45	17	3	0	0 0.15	10	10	0	0	0.5	5	13	1	1	0.9
10 0-0.5	con	7	17	3	0	0 0.15	1	19	0	0	0.95	14	0	5	1	0.65
	Cl	8	18	2	0	0 0.1	3	16	1	0	0.9	4	12	1	3	1.15
	water	9	16	4	0	0 0.2	15	5	0	0	0.25	0	15	4	1	1.3
15 0-0.5	con	37	16	4	0	0 0.2	1	16	2	1	1.15	0	8	6	6	1.9
	Cl	38	20	0	0	0 0	4	16	0	0	0.8	5	11	4	0	0.95
	water	39	17	3	0	0 0.15	2	16	2	0	1	1	13	5	1	1.3
YELLOW																
9 0-21	con	4	17	2	1	0 0.2	9	7	4	0	0.75	4	4	5	7	1.75
	Cl	5	13	7	0	0 0.35	13	6	1	0	0.4	10	5	4	1	0.8
	water	6	10	10	0	0 0.5	11	9	0	0	0.45	10	7	1	2	0.75
14 0-21	con	34	12	7	1	0 0.45	7	8	2	3	1.05	0	0	7	13	2.65
	Cl	35	15	5	0	0 0.25	12	8	0	0	0.4	13	5	0	2	0.55
	water	36	13	7	0	0 0.35	11	9	0	0	0.45	0	1	13	6	2.25
11 0-2	con	16	12	8	0	0 0.4	8	9	3	0	0.75	0	0	13	7	2.35
	Cl	17	16	4	0	0 0.2	8	12	0	0	0.6	5	10	3	2	1.1
	water	18	13	7	0	0 0.35	10	10	0	0	0.5	0	6	8	6	2
13 0-2	con	28	14	6	0	0 0.3	12	5	3	0	0.55	0	4	9	7	2.15
	Cl	29	15	5	0	0 0.25	6	11	3	0	0.85	0	11	6	3	1.6
	water	30	20	0	0	0 0	7	8	4	1	0.95	0	2	8	10	2.4
12 0-1	con	22	13	7	0	0 0.35	1	14	5	0	1.2	0	8	10	2	1.7
	Cl	23	10	10	0	0 0.5	4	16	0	0	0.8	4	10	5	1	1.15
	water	24	13	7	0	0 0.35	5	15	0	0	0.75	0	4	9	7	2.15
16 0-1	con	46	17	3	0	0 0.15	1	13	4	2	1.35	0	1	9	10	2.45
	Cl	47	11	9	0	0 0.45	7	13	0	0	0.65	2	8	10	0	1.4
	water	48	15	5	0	0 0.25	2	16	2	0	1	0	0	10	10	2.5
10 0-0.5	con	10	17	3	0	0 0.15	8	10	2	0	0.7	10	7	1	2	0.75
	Cl	11	15	5	0	0 0.25	3	15	1	1	1	0	5	7	8	2.15
	water	12	13	7	0	0 0.35	2	16	2	0	1	2	11	5	2	1.35
15 0-0.5	con	40	15	5	0	0 0.25	5	12	3	0	0.9	0	9	6	5	1.8
	Cl	41	12	8	0	0 0.4	4	15	1	0	0.85	0	15	3	2	1.35
	water	42	13	7	0	0 0.35	3	13	4	0	1.05	0	3	11	6	2.15

TRANSFRESH STORAGE RESEARCH BELL PEPPERS/2 ANNEXE 2.2

Test red en yellow fruits on low oxygen at 1C

Pre storage treatments
no treatment
dipping 1 minute in water, followed by drying in tissues
dipping 1 minute in 100 ppm chloride solution followed by drying in tissues

Start: 19-10-1995
Assessments: 02-11-1995 (after cold storage)
06-11-1995 (after 4 days at 8C)
09-11-1995 (after 3 days extra at 20C)

Parameter LTB/Pitting

Cont/cond			after 14 d					after 14+4					after 14+4+3 d				
		Samp	0	1	2	3	Calc	0	1	2	3	Calc	0	1	2	3	Calc
RED																	
9 0-21	con	1	20	0	0	0	0	16	4	0	0	0.2	16	4	0	0	0.2
	Cl	2	20	0	0	0	0	14	5	1	0	0.35	14	6	0	0	0.3
	water	3	20	0	0	0	0	14	5	1	0	0.35	13	5	2	0	0.45
14 0-21	con	31	20	0	0	0	0	13	6	1	0	0.4	12	7	1	0	0.45
	Cl	32	20	0	0	0	0	15	5	0	0	0.25	12	8	0	0	0.4
	water	33	20	0	0	0	0	17	3	0	0	0.15	10	10	0	0	0.5
11 0-2	con	13	20	0	0	0	0	11	8	1	0	0.5	11	8	1	0	0.5
	Cl	14	20	0	0	0	0	12	6	1	1	0.55	13	5	2	0	0.45
	water	15	20	0	0	0	0	10	6	4	0	0.7	8	9	3	0	0.75
13 0-2	con	25	20	0	0	0	0	8	12	0	0	0.6	9	11	0	0	0.55
	Cl	26	20	0	0	0	0	15	5	0	0	0.25	15	4	1	0	0.3
	water	27	20	0	0	0	0	11	7	2	0	0.55	12	7	1	0	0.45
12 0-1	con	19	20	0	0	0	0	14	5	1	0	0.35	13	6	1	0	0.4
	Cl	20	20	0	0	0	0	9	8	3	0	0.7	8	10	2	0	0.7
	water	21	20	0	0	0	0	6	11	3	0	0.85	7	10	2	1	0.85
16 0-1	con	43	20	0	0	0	0	12	8	0	0	0.4	10	10	0	0	0.5
	Cl	44	20	0	0	0	0	15	5	0	0	0.25	11	7	2	0	0.55
	water	45	20	0	0	0	0	13	5	2	0	0.45	10	9	1	0	0.55
10 0-0.5	con	7	20	0	0	0	0	7	9	4	0	0.85	6	10	3	1	0.95
	Cl	8	20	0	0	0	0	3	12	4	1	1.15	6	9	2	3	1.1
	water	9	20	0	0	0	0	2	8	7	3	1.55	2	9	6	3	1.5
15 0-0.5	con	37	20	0	0	0	0	8	8	4	0	0.8	5	11	3	1	1
	Cl	38	20	0	0	0	0	5	10	5	0	1	5	8	5	2	1.2
	water	39	20	0	0	0	0	5	7	6	2	1.25	5	8	7	0	1.1
YELLOW																	
9 0-21	con	4	20	0	0	0	0	19	1	0	0	0.05	18	2	0	0	0.1
	Cl	5	20	0	0	0	0	17	3	0	0	0.15	17	3	0	0	0.15
	water	6	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
14 0-21	con	34	20	0	0	0	0	17	3	0	0	0.15	19	1	0	0	0.05
	Cl	35	20	0	0	0	0	18	2	0	0	0.1	16	4	0	0	0.2
	water	36	20	0	0	0	0	19	1	0	0	0.05	17	3	0	0	0.15
11 0-2	con	16	20	0	0	0	0	17	3	0	0	0.15	13	7	0	0	0.35
	Cl	17	20	0	0	0	0	16	4	0	0	0.2	14	5	1	0	0.35
	water	18	20	0	0	0	0	13	7	0	0	0.35	15	5	0	0	0.25
13 0-2	con	28	20	0	0	0	0	18	2	0	0	0.1	20	0	0	0	0
	Cl	29	20	0	0	0	0	17	3	0	0	0.15	14	6	0	0	0.3
	water	30	20	0	0	0	0	18	2	0	0	0.1	17	3	0	0	0.15
12 0-1	con	22	20	0	0	0	0	7	10	3	0	0.8	8	10	2	0	0.7
	Cl	23	20	0	0	0	0	11	5	4	0	0.65	11	9	0	0	0.45
	water	24	20	0	0	0	0	9	11	0	0	0.55	12	6	2	0	0.5
16 0-1	con	46	20	0	0	0	0	10	9	1	0	0.55	5	10	5	0	1
	Cl	47	20	0	0	0	0	10	8	2	0	0.6	10	10	0	0	0.5
	water	48	20	0	0	0	0	10	9	1	0	0.55	9	10	1	0	0.6
10 0-0.5	con	10	20	0	0	0	0	12	5	3	0	0.55	5	11	4	0	0.95
	Cl	11	20	0	0	0	0	6	11	3	0	0.85	2	10	5	3	1.45
	water	12	20	0	0	0	0	7	9	4	0	0.85	5	10	5	0	1
15 0-0.5	con	40	20	0	0	0	0	9	9	2	0	0.65	5	13	2	0	0.85
	Cl	41	20	0	0	0	0	5	11	4	0	0.95	2	0	16	2	1.9
	water	42	20	0	0	0	0	7	8	4	1	0.95	9	10	1	0	0.6

TRANSFRESH STORAGE RESEARCH BELL PEPPERS/2 ANNEXE 2.3

Test red en yellow fruits on low oxygen at 1C

Pre storage treatments
no treatment
dipping 1 minute in water, followed by drying in tissues
dipping 1 minute in 100 ppm chloride solution followed by drying in tissues

Start: 19-10-1995
Assessments: 02-11-1995 (after cold storage)
06-11-1995 (after 4 days at 8C)
09-11-1995 (after 3 days extra at 20C)

Parameter Softness

Cont/cond			after 14 d					after 14+4					after 14+4+3 d				
		Samp	0	1	2	3	Calc	0	1	2	3	Calc	0	1	2	3	Calc
RED																	
9 0-21	con	1	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
	Cl	2	20	0	0	0	0	20	0	0	0	0	17	3	0	0	0.15
	water	3	20	0	0	0	0	19	1	0	0	0.05	19	1	0	0	0.05
14 0-21	con	31	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
	Cl	32	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
	water	33	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
11 0-2	con	13	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
	Cl	14	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
	water	15	20	0	0	0	0	18	2	0	0	0.1	20	0	0	0	0
13 0-2	con	25	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
	Cl	26	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
	water	27	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
12 0-1	con	19	20	0	0	0	0	18	2	0	0	0.1	20	0	0	0	0
	Cl	20	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
	water	21	20	0	0	0	0	19	1	0	0	0.05	19	1	0	0	0.05
16 0-1	con	43	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
	Cl	44	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
	water	45	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
10 0-0.5	con	7	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
	Cl	8	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
	water	9	20	0	0	0	0	19	1	0	0	0.05	19	1	0	0	0.05
15 0-0.5	con	37	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
	Cl	38	20	0	0	0	0	19	1	0	0	0.05	20	0	0	0	0
	water	39	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
YELLOW																	
9 0-21	con	4	20	0	0	0	0	19	1	0	0	0.05	18	2	0	0	0.1
	Cl	5	18	2	0	0	0.1	19	1	0	0	0.05	18	2	0	0	0.1
	water	6	20	0	0	0	0	20	0	0	0	0	16	4	0	0	0.2
14 0-21	con	34	19	1	0	0	0.05	18	2	0	0	0.1	11	9	0	0	0.45
	Cl	35	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
	water	36	20	0	0	0	0	20	0	0	0	0	17	3	0	0	0.15
11 0-2	con	16	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
	Cl	17	20	0	0	0	0	20	0	0	0	0	20	0	0	0	0
	water	18	20	0	0	0	0	20	0	0	0	0	17	3	0	0	0.15
13 0-2	con	28	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
	Cl	29	20	0	0	0	0	20	0	0	0	0	19	1	0	0	0.05
	water	30	13	7	0	0	0.35	20	0	0	0	0	19	1	0	0	0.05
12 0-1	con	22	20	0	0	0	0	20	0	0	0	0	18	2	0	0	0.1
	Cl	23	20	0	0	0	0	19	1	0	0	0.05	18	2	0	0	0.1
	water	24	18	1	1	0	0.15	17	3	0	0	0.15	14	6	0	0	0.3
16 0-1	con	46	20	0	0	0	0	17	3	0	0	0.15	16	4	0	0	0.2
	Cl	47	20	0	0	0	0	18	2	0	0	0.1	19	1	0	0	0.05
	water	48	20	0	0	0	0	18	2	0	0	0.1	19	0	0	1	0.15
10 0-0.5	con	10	20	0	0	0	0	19	1	0	0	0.05	18	2	0	0	0.1
	Cl	11	18	2	0	0	0.1	18	2	0	0	0.1	20	0	0	0	0
	water	12	20	0	0	0	0	15	5	0	0	0.25	17	3	0	0	0.15
15 0-0.5	con	40	20	0	0	0	0	19	1	0	0	0.05	19	1	0	0	0.05
	Cl	41	20	0	0	0	0	16	4	0	0	0.2	18	1	1	0	0.15
	water	42	19	1	0	0	0.05	19	1	0	0	0.05	18	2	0	0	0.1

TRANSFRESH STORAGE RESEARCH BELL PEPPERS/2 ANNEXE 2.4

Test red en yellow fruits on low oxygen at 1C

Pre storage treatments
no treatment
dipping 1 minute in water, followed by drying in tissues
dipping 1 minute in 100 ppm chloride solution followed by drying in tissues

Start: 19-10-1995
Assessments: 02-11-1995 (after cold storage)
06-11-1995 (after 4 days at 8C)
09-11-1995 (after 3 days extra at 20C)

Parameter Stem decay

Cont/cond		after 14 d					after 14+4					after 14+4+3 d				
		Samp	0	1	2	3 Calc		0	1	2	3 Calc		0	1	2	3 Calc
RED																
9 0-21	con	1	18	2	0	0	0.1	18	1	0	1	0.2	11	6	2	1 0.65
	Cl	2	20	0	0	0	0	19	1	0	0	0.05	15	4	0	1 0.35
	water	3	20	0	0	0	0	18	1	1	0	0.15	16	3	0	1 0.3
14 0-21	con	31	10	10	0	0	0.5	18	1	1	0	0.15	13	4	1	2 0.6
	Cl	32	20	0	0	0	0	20	0	0	0	0	16	3	1	0 0.25
	water	33	19	1	0	0	0.05	18	1	1	0	0.15	16	2	2	0 0.3
11 0-2	con	13	16	4	0	0	0.2	18	2	0	0	0.1	2	11	5	2 1.35
	Cl	14	20	0	0	0	0	19	0	0	1	0.15	14	4	1	1 0.45
	water	15	18	2	0	0	0.1	16	4	0	0	0.2	5	6	5	4 1.4
13 0-2	con	25	18	2	0	0	0.1	17	2	1	0	0.2	6	5	4	5 1.4
	Cl	26	20	0	0	0	0	19	1	0	0	0.05	16	4	0	0 0.2
	water	27	20	0	0	0	0	18	2	0	0	0.1	10	7	3	0 0.65
12 0-1	con	19	15	5	0	0	0.25	15	4	1	0	0.3	8	5	3	4 1.15
	Cl	20	20	0	0	0	0	19	1	0	0	0.05	17	2	1	0 0.2
	water	21	18	2	0	0	0.1	15	4	0	1	0.35	11	7	1	1 0.6
16 0-1	con	43	16	4	0	0	0.2	17	3	0	0	0.15	6	8	3	3 1.15
	Cl	44	20	0	0	0	0	19	1	0	0	0.05	12	6	1	1 0.55
	water	45	19	1	0	0	0.05	17	3	0	0	0.15	8	10	1	1 0.75
10 0-0.5	con	7	20	0	0	0	0	18	2	0	0	0.1	4	11	4	1 1.1
	Cl	8	19	1	0	0	0.05	20	0	0	0	0	16	2	1	1 0.35
	water	9	17	3	0	0	0.15	15	5	0	0	0.25	4	11	4	1 1.1
15 0-0.5	con	37	14	6	0	0	0.3	14	4	2	0	0.4	5	4	6	5 1.55
	Cl	38	20	0	0	0	0	18	2	0	0	0.1	15	2	3	0 0.4
	water	39	20	0	0	0	0	19	1	0	0	0.05	6	9	5	0 0.95
YELLOW																
9 0-21	con	4	19	0	1	0	0.1	13	3	4	0	0.55	7	9	2	2 0.95
	Cl	5	20	0	0	0	0	18	1	1	0	0.15	18	1	1	0 0.15
	water	6	20	0	0	0	0	18	2	0	0	0.1	12	8	0	0 0.4
14 0-21	con	34	20	0	0	0	0	14	3	1	2	0.55	1	11	4	4 1.55
	Cl	35	20	0	0	0	0	20	0	0	0	0	18	1	0	1 0.2
	water	36	20	0	0	0	0	18	2	0	0	0.1	1	9	7	3 1.6
11 0-2	con	16	19	1	0	0	0.05	11	6	3	0	0.6	0	2	10	8 2.3
	Cl	17	20	0	0	0	0	19	1	0	0	0.05	10	7	2	1 0.7
	water	18	20	0	0	0	0	15	5	0	0	0.25	1	6	7	6 1.9
13 0-2	con	28	20	0	0	0	0	16	2	2	0	0.3	0	11	4	5 1.7
	Cl	29	20	0	0	0	0	17	0	3	0	0.3	8	5	5	2 1.05
	water	30	20	0	0	0	0	13	2	4	1	0.65	0	1	11	8 2.35
12 0-1	con	22	20	0	0	0	0	13	2	5	0	0.6	0	11	7	2 1.55
	Cl	23	20	0	0	0	0	17	3	0	0	0.15	15	0	4	1 0.55
	water	24	20	0	0	0	0	17	3	0	0	0.15	1	7	7	5 1.8
16 0-1	con	46	20	0	0	0	0	11	4	3	2	0.8	0	1	2	17 2.8
	Cl	47	20	0	0	0	0	18	2	0	0	0.1	7	6	7	0 1
	water	48	20	0	0	0	0	13	5	2	0	0.45	0	3	9	8 2.25
10 0-0.5	con	10	20	0	0	0	0	15	3	2	0	0.35	0	10	4	6 1.8
	Cl	11	20	0	0	0	0	17	1	1	1	0.3	8	5	5	2 1.05
	water	12	20	0	0	0	0	15	3	2	0	0.35	0	10	9	1 1.55
15 0-0.5	con	40	20	0	0	0	0	16	2	2	0	0.3	2	8	6	4 1.6
	Cl	41	20	0	0	0	0	18	2	0	0	0.1	9	9	2	0 0.65
	water	42	20	0	0	0	0	12	5	3	0	0.55	1	4	10	5 1.95

TRANSFRESH STORAGE RESEARCH BELL PEPPERS/2 ANNEXE 2.5

Test red en yellow fruits on low oxygen at 1C

Pre storage treatments
no treatment
dipping 1 minute in water, followed by drying in tissues
dipping 1 minute in 100 ppm chloride solution followed by drying in tissues

Start: 19-10-1995
Assessments: 02-11-1995 (after cold storage)
06-11-1995 (after 4 days at 8C)
09-11-1995 (after 3 days extra at 20C)

Parameter Fruit decay

Cont/cond		after 14 d					after 14+4					after 14+4+3 d				
		Samp	0	1	2	3 Calc	0	1	2	3 Calc		0	1	2	3 Calc	
RED																
9 0-21	con	1	9	9	2	0 0.65	7	12	0	1 0.75		3	12	1	4 1.3	
	Cl	2	18	1	1	0 0.15	17	2	1	0 0.2		10	8	0	2 0.7	
	water	3	17	2	1	0 0.2	17	2	0	1 0.25		16	3	0	1 0.3	
14 0-21	con	31	14	6	0	0 0.3	11	8	1	0 0.5		1	13	4	2 1.35	
	Cl	32	19	1	0	0 0.05	19	1	0	0 0.05		16	3	1	0 0.25	
	water	33	19	1	0	0 0.05	18	2	0	0 0.1		8	8	2	2 0.9	
11 0-2	con	13	12	8	0	0 0.4	8	12	0	0 0.6		6	14	0	0 0.7	
	Cl	14	20	0	0	0 0	16	4	0	0 0.2		12	7	1	0 0.45	
	water	15	20	0	0	0 0	17	2	0	1 0.25		14	5	0	1 0.4	
13 0-2	con	25	10	10	0	0 0.5	5	14	1	0 0.8		7	9	4	0 0.85	
	Cl	26	18	2	0	0 0.1	18	1	0	1 0.2		14	5	0	1 0.4	
	water	27	20	0	0	0 0	16	4	0	0 0.2		15	4	0	1 0.35	
12 0-1	con	19	13	7	0	0 0.35	13	5	1	1 0.5		9	7	2	2 0.85	
	Cl	20	17	3	0	0 0.15	18	1	1	0 0.15		14	6	0	0 0.3	
	water	21	20	0	0	0 0	19	1	0	0 0.05		8	12	0	0 0.6	
16 0-1	con	43	12	8	0	0 0.4	12	8	0	0 0.4		7	11	1	1 0.8	
	Cl	44	19	1	0	0 0.05	19	1	0	0 0.05		16	4	0	0 0.2	
	water	45	19	1	0	0 0.05	16	4	0	0 0.2		17	3	0	0 0.15	
10 0-0.5	con	7	17	3	0	0 0.15	10	10	0	0 0.5		7	12	1	0 0.7	
	Cl	8	19	1	0	0 0.05	15	4	1	0 0.3		13	5	0	2 0.55	
	water	9	19	1	0	0 0.05	16	4	0	0 0.2		13	7	0	0 0.35	
15 0-0.5	con	37	9	11	0	0 0.55	7	12	0	1 0.75		7	12	0	1 0.75	
	Cl	38	20	0	0	0 0	20	0	0	0 0		16	3	1	0 0.25	
	water	39	18	2	0	0 0.1	16	2	2	0 0.3		15	1	0	1 0.235	
YELLOW																
9 0-21	con	4	20	0	0	0 0	20	0	0	0 0		10	2	3	5 1.15	
	Cl	5	20	0	0	0 0	19	1	0	0 0.05		15	1	3	1 0.5	
	water	6	20	0	0	0 0	20	0	0	0 0		16	1	1	2 0.45	
14 0-21	con	34	19	0	1	0 0.1	18	0	1	1 0.25		5	3	3	9 1.8	
	Cl	35	20	0	0	0 0	20	0	0	0 0		19	0	0	1 0.15	
	water	36	20	0	0	0 0	20	0	0	0 0		6	5	6	3 1.3	
11 0-2	con	16	20	0	0	0 0	19	1	0	0 0.05		10	6	3	1 0.75	
	Cl	17	20	0	0	0 0	19	1	0	0 0.05		16	2	1	1 0.35	
	water	18	20	0	0	0 0	20	0	0	0 0		18	1	1	0 0.15	
13 0-2	con	28	19	1	0	0 0.05	15	4	1	0 0.3		7	6	5	2 1.1	
	Cl	29	20	0	0	0 0	18	0	2	0 0.2		18	1	0	1 0.2	
	water	30	13	6	1	0 0.4	17	3	0	0 0.15		7	4	7	2 1.2	
12 0-1	con	22	20	0	0	0 0	20	0	0	0 0		7	10	3	0 0.8	
	Cl	23	20	0	0	0 0	20	0	0	0 0		18	1	1	0 0.15	
	water	24	20	0	0	0 0	20	0	0	0 0		13	3	2	2 0.65	
16 0-1	con	46	20	0	0	0 0	19	0	1	0 0.1		3	8	7	2 1.4	
	Cl	47	20	0	0	0 0	19	1	0	0 0.05		16	1	3	0 0.35	
	water	48	20	0	0	0 0	19	1	0	0 0.05		12	5	1	2 0.65	
10 0-0.5	con	10	20	0	0	0 0	18	2	0	0 0.1		10	5	3	2 0.85	
	Cl	11	20	0	0	0 0	20	0	0	0 0		18	2	0	0 0.1	
	water	12	20	0	0	0 0	18	2	0	0 0.1		12	2	3	3 0.85	
15 0-0.5	con	40	20	0	0	0 0	18	1	1	0 0.15		14	5	0	1 0.4	
	Cl	41	19	1	0	0 0.05	19	0	1	0 0.1		17	0	1	2 0.4	
	water	42	20	0	0	0 0	20	0	0	0 0		11	7	1	1 0.6	

TRANSFRESH BELL PEPPER STORAGE RESEARCH/2 ANNEXE 2.6

Test red en yellow fruits on low oxygen at 1C

Pre storage treatments
no treatment
dipping 1 minute in water, followed by drying in tissues
dipping 1 minute in 100 ppm chloride solution followed by drying in tissues

Start: 19-10-1995
Assessments: 02-11-1995 (after cold storage)
06-11-1995 (after 4 days at 8C)
09-11-1995 (after 3 days extra at 20C)

Parameter Waterstain

Cont/cond		after 14 d					after 14+4					after 14+4+3 d				
		Samp	0	1	2	3 Calc	0	1	2	3 Calc		0	1	2	3 Calc	
RED																
9 0-21	con	1	18	2	0	0 0.1	20	0	0	0 0		19	1	0	0 0.05	
	Cl	2	18	2	0	0 0.1	19	1	0	0 0.05		17	3	0	0 0.15	
	water	3	18	1	0	1 0.2	19	1	0	0 0.05		19	1	0	0 0.05	
14 0-21	con	31	18	1	0	0 0.053	19	1	0	0 0.05		20	0	0	0 0	
	Cl	32	19	1	0	0 0.05	18	2	0	0 0.1		19	1	0	0 0.05	
	water	33	20	0	0	0 0	18	2	0	0 0.1		18	2	0	0 0.1	
11 0-2	con	13	20	0	0	0 0	20	0	0	0 0		19	1	0	0 0.05	
	Cl	14	18	2	0	0 0.1	19	1	0	0 0.05		18	2	0	0 0.1	
	water	15	19	1	0	0 0.05	20	0	0	0 0		20	0	0	0 0	
13 0-2	con	25	19	1	0	0 0.05	20	0	0	0 0		20	0	0	0 0	
	Cl	26	19	1	0	0 0.05	19	1	0	0 0.05		19	1	0	0 0.05	
	water	27	19	1	0	0 0.05	19	1	0	0 0.05		19	1	0	0 0.05	
12 0-1	con	19	19	1	0	0 0.05	20	0	0	0 0		20	0	0	0 0	
	Cl	20	20	0	0	0 0	20	0	0	0 0		20	0	0	0 0	
	water	21	19	1	0	0 0.05	19	1	0	0 0.05		19	1	0	0 0.05	
16 0-1	con	43	19	1	0	0 0.05	19	1	0	0 0.05		19	1	0	0 0.05	
	Cl	44	18	1	1	0 0.15	17	3	0	0 0.15		19	1	0	0 0.05	
	water	45	19	1	0	0 0.05	19	1	0	0 0.05		18	2	0	0 0.1	
10 0-0.5	con	7	18	1	1	0 0.15	17	3	0	0 0.15		18	2	0	0 0.1	
	Cl	8	20	0	0	0 0	20	0	0	0 0		20	0	0	0 0	
	water	9	19	1	0	0 0.05	19	1	0	0 0.05		19	1	0	0 0.05	
15 0-0.5	con	37	20	0	0	0 0	20	0	0	0 0		20	0	0	0 0	
	Cl	38	20	0	0	0 0	20	0	0	0 0		20	0	0	0 0	
	water	39	19	1	0	0 0.05	20	0	0	0 0		19	1	0	0 0.05	
YELLOW																
9 0-21	con	4	18	1	1	0 0.15	15	3	2	0 0.35		18	2	0	0 0.1	
	Cl	5	15	3	2	0 0.35	15	5	0	0 0.25		18	2	0	0 0.1	
	water	6	10	6	2	2 0.8	13	6	1	0 0.4		17	3	0	0 0.15	
14 0-21	con	34	13	3	3	1 0.6	14	4	2	0 0.4		16	4	0	0 0.2	
	Cl	35	15	2	3	0 0.4	12	5	3	0 0.55		13	5	1	1 0.5	
	water	36	13	6	1	0 0.4	12	5	3	0 0.55		16	4	0	0 0.2	
11 0-2	con	16	13	7	0	0 0.35	14	5	1	0 0.35		15	5	0	0 0.25	
	Cl	17	16	3	1	0 0.25	13	4	3	0 0.5		15	5	0	0 0.25	
	water	18	13	5	2	0 0.45	14	6	0	0 0.3		13	7	0	0 0.35	
13 0-2	con	28	15	4	1	0 0.3	15	5	0	0 0.25		16	4	0	0 0.2	
	Cl	29	15	3	2	0 0.35	11	6	3	0 0.6		15	5	0	0 0.25	
	water	30	20	0	0	0 0	13	5	2	0 0.45		15	5	0	0 0.25	
12 0-1	con	22	13	3	0	4 0.75	13	5	2	0 0.45		15	5	0	0 0.25	
	Cl	23	10	5	3	2 0.85	13	6	2	0 0.476		15	5	0	0 0.25	
	water	24	15	3	2	0 0.35	14	5	1	0 0.35		16	4	0	0 0.2	
16 0-1	con	46	17	0	0	3 0.45	16	2	2	0 0.3		17	3	0	0 0.15	
	Cl	47	11	6	3	0 0.6	13	7	0	0 0.35		14	6	0	0 0.3	
	water	48	15	3	1	1 0.4	14	4	2	0 0.4		17	3	0	0 0.15	
10 0-0.5	con	10	16	3	1	0 0.25	15	5	0	0 0.25		15	5	0	0 0.25	
	Cl	11	16	3	0	0 0.158	18	2	0	0 0.1		17	3	0	0 0.15	
	water	12	13	4	3	0 0.5	16	3	1	0 0.25		16	4	0	0 0.2	
15 0-0.5	con	40	14	6	0	0 0.3	14	4	2	0 0.4		15	5	0	0 0.25	
	Cl	41	13	5	2	0 0.45	12	6	2	0 0.5		16	4	0	0 0.2	
	water	42	13	5	2	0 0.45	15	5	0	0 0.25		13	7	0	0 0.35	

TRANSFRESH BELL PEPPER STORAGE RESEARCH/2 ANNEXE 2.7

Test red en yellow fruits on low oxygen at 1C

Pre storage treatments
no treatment
dipping 1 minute in water, followed by drying in tissues
dipping 1 minute in 100 ppm chloride solution followed by drying in tissues

Start: 19-10-1995
Assessments: 02-11-1995 (after cold storage)
06-11-1995 (after 4 days at 8C)
09-11-1995 (after 3 days extra at 20C)

Parameter *Weight loss*

Cont/cond		Sample		14 days	14+4 days	14+4+3 days	Calculations GV 2 week	GV 3 weeks	GV 3 days 20C
RED			Start						
9 0-21	con	1	4942	4805	4860	4752	2.77	3.84	2.22
	Cl	2	4837	4647	4666	4587	3.93	5.17	1.69
	water	3	4913	4695	4697	4688	4.44	4.58	0.19
14 0-21	con	31	4666	4582	4542	4479	1.8	4.01	1.39
	Cl	32	4808	4686	4669	4611	2.54	4.1	1.24
	water	33	4532	4449	4420	4313	1.83	4.83	2.42
11 0-2	con	13	5021	4853	4877	4799	3.35	4.42	1.6
	Cl	14	4767	4656	4667	4636	2.33	2.75	0.66
	water	15	4941	4736	4766	4736	4.15	4.15	0.63
13 0-2	con	25	4805	4713	4710	4640	1.91	3.43	1.49
	Cl	26	4661	4582	4555	4459	1.69	4.33	2.11
	water	27	4847	4711	4701	4649	2.81	4.09	1.11
12 0-1	con	19	4865	4762	4764	4702	2.12	3.35	1.3
	Cl	20	4740	4605	4626	4570	2.85	3.59	1.21
	water	21	4872	4713	4711	4664	3.26	4.27	1
16 0-1	con	43	5050	4885	4829	4811	3.27	4.73	0.37
	Cl	44	4781	4707	4678	4633	1.55	3.1	0.96
	water	45	4836	4711	4686	4607	2.58	4.74	1.69
10 0-0.5	con	7	4810	4776	4692	4583	0.71	4.72	2.32
	Cl	8	4884	4739	4779	4722	2.97	3.32	1.19
	water	9	4812	4632	4668	4588	3.74	4.66	1.71
15 0-0.5	con	37	4899	4794	4798	4721	2.14	3.63	1.6
	Cl	38	4949	4834	4833	4758	2.32	3.86	1.55
	water	39	5035	4888	4893	4797	2.92	4.73	1.96
YELLOW									
9 0-21	con	4	5018	4918	4927	4890	1.99	2.55	0.75
	Cl	5	4984	4849	4855	4751	2.71	4.67	2.14
	water	6	4692	4567	4577	4496	2.66	4.18	1.77
14 0-21	con	34	4775	4653	4634	4560	2.55	4.5	1.6
	Cl	35	5227	5133	5088	5001	1.8	4.32	1.71
	water	36	4678	4588	4585	4491	1.92	4	2.05
11 0-2	con	16	4862	4756	4760	4721	2.18	2.9	0.82
	Cl	17	4862	4735	4761	4707	2.61	3.19	1.13
	water	18	4880	4753	4773	4683	2.6	4.04	1.89
13 0-2	con	28	4826	4742	4763	4681	1.74	3	1.72
	Cl	29	5155	5109	5080	4930	0.89	4.36	2.95
	water	30	4734	4671	4409	4381	1.33	7.46	0.64
12 0-1	con	22	4951	4834	4876	4837	2.36	2.3	0.8
	Cl	23	5224	5104	5129	5042	2.3	3.48	1.7
	water	24	5049	4979	4943	4873	1.39	3.49	1.42
16 0-1	con	46	5033	4973	4899	4833	1.19	3.97	1.35
	Cl	47	5094	5039	5019	4933	1.08	3.16	1.71
	water	48	4970	4884	4812	4731	1.73	4.81	1.68
10 0-0.5	con	10	4897	4789	4815	4751	2.21	2.98	1.33
	Cl	11	4693	4558	4589	4537	2.88	3.32	1.13
	water	12	5117	4990	4990	4972	2.48	2.83	0.36
15 0-0.5	con	40	5190	5077	5102	5030	2.18	3.08	1.41
	Cl	41	4730	4666	4649	4610	1.35	2.54	0.84
	water	42	5001	4926	4903	4792	1.5	4.18	2.26

TRANSFRESH BELL PEPPER STORAGE RESEARCH/3 ANNEXE 3.2

Test on the effect of high CO2 on yellow and red bell peppers at 1
in a flow-through system
Start: 26-10-1995
Assessment 9-11, 13-11 en 16-11-1995

Parameter stem decay

Cont/cond	assessments after 14 d					14+4 d					14+4+3 d				
	Samp	0	1	2	3		0	1	2	3		0	1	2	3	
YELLOW						Calc					Calc					Calc
10 0+21	4	15	0	0	0	0	14	1	0	0	0.067	3	10	2	0	0.933
11 0+2	6	15	0	0	0	0	14	1	0	0	0.067	2	8	4	1	1.267
9 10+2	2	13	2	0	0	0.133	10	5	0	0	0.333	0	7	6	2	1.667
14 20+2	12	14	1	0	0	0.067	9	6	0	0	0.4	0	4	8	3	1.933
15 0+1	14	15	0	0	0	0	13	2	0	0	0.133	2	8	5	0	1.2
12 10+1	8	15	0	0	0	0	11	4	0	0	0.267	2	5	5	3	1.6
13 20+1	10	15	0	0	0	0	12	3	0	0	0.2	0	5	6	4	1.933
16 0+0	16	15	0	0	0	0	10	5	0	0	0.333	0	1	4	10	2.6
RED																
10 0+21	3	15	0	0	0	0	14	1	0	0	0.067	7	7	1	0	0.6
11 0+2	5	15	0	0	0	0	10	5	0	0	0.333	6	8	1	0	0.667
9 10+2	1	13	2	0	0	0.133	13	2	0	0	0.133	4	9	2	0	0.867
14 20+2	11	15	0	0	0	0	11	4	0	0	0.267	1	6	5	3	1.667
15 0+1	13	15	0	0	0	0	11	4	0	0	0.267	7	6	2	0	0.667
12 10+1	7	15	0	0	0	0	12	3	0	0	0.2	4	10	1	0	0.8
13 20+1	9	14	1	0	0	0.067	11	4	0	0	0.267	2	4	7	2	1.6

Parameter fruit decay

Cont/cond	Assessment after 14 d					14+4 d					14+4+3 d				
	Samp	0	1	2	3		0	1	2	3		0	1	2	3	
YELLOW						Calc					Calc					Calc
10 0+21	4	14	1	0	0	0.067	13	2	0	0	0.133	11	4	0	0	0.267
11 0+2	6	14	1	0	0	0.067	11	3		1	0.4	11	2	1	1	0.467
9 10+2	2	13	2	0	0	0.133	13	1	1	0	0.2	8	5	1	1	0.667
14 20+2	12	13	2	0	0	0.133	13	2	0	0	0.133	7	5	1	2	0.867
15 0+1	14	13	2	0	0	0.133	13	2	0	0	0.133	9	5	0	1	0.533
12 10+1	8	12	3	0	0	0.2	13	2	0	0	0.133	8	7	0	0	0.467
13 20+1	10	13	2	0	0	0.133	13	2	0	0	0.133	9	3	3	0	0.6
16 0+0	16	13	2	0	0	0.133	11	4	0	0	0.267	0	10	2	3	1.533
RED																
10 0+21	3	13	2	0	0	0.133	11	4	0	0	0.267	10	3	2	0	0.467
11 0+2	5	11	4	0	0	0.267	9	6	0	0	0.4	9	5	1	0	0.467
9 10+2	1	13	2	0	0	0.133	12	3	0	0	0.2	8	7	0	0	0.467
14 20+2	11	13	2	0	0	0.133	12	3	0	0	0.2	9	6	0	0	0.4
15 0+1	13	12	3	0	0	0.2	10	5	0	0	0.333	10	5	0	0	0.333
12 10+1	7	10	5	0	0	0.333	10	5	0	0	0.333	9	6	0	0	0.4
13 20+1	9	12	3	0	0	0.2	12	3	0	0	0.2	7	6	1	1	0.733

Parameter waterstain

Cont/cond	Assessments after 14 d					14+4 d					14+4+3 d				
	Samp	0	1	2	3		0	1	2	3		0	1	2	3	
YELLOW						Calc					Calc					Calc
10 0+21	4	13	2	0	0	0.133	14	1	0	0	0.067	13	1	1	0	0.2
11 0+2	6	11	4	0	0	0.267	15	0	0	0	0	14	1	0	0	0.067
9 10+2	2	13	2	0	0	0.133	15	0	0	0	0	14	1	0	0	0.067
14 20+2	12	15	0	0	0	0	15	0	0	0	0	14	1	0	0	0.067
15 0+1	14	14	1	0	0	0.067	15	0	0	0	0	14	1	0	0	0.067
12 10+1	8	12	3	0	0	0.2	12	3	0	0	0.2	14	1	0	0	0.067
13 20+1	10	12	3	0	0	0.2	13	2	0	0	0.133	14	1	0	0	0.067
16 0+0	16	15	0	0	0	0	13	2	0	0	0.133	14	1	0	0	0.067
RED																
10 0+21	3	15	0	0	0	0	14	1	0	0	0.067	15	0	0	0	0
11 0+2	5	15	0	0	0	0	14	1	0	0	0.067	15	0	0	0	0
9 10+2	1	15	0	0	0	0	14	1	0	0	0.067	14	1	0	0	0.067
14 20+2	11	15	0	0	0	0	14	1	0	0	0.067	14	1	0	0	0.067
15 0+1	13	15	0	0	0	0	15	0	0	0	0	15	0	0	0	0
12 10+1	7	15	0	0	0	0	15	0	0	0	0	15	0	0	0	0
13 20+1	9	15	0	0	0	0	14	1	0	0	0.067	15	0	0	0	0

TRANSFRESH BELL PEPPER STORAGE RESEARCH/3 ANNEXE 3.1

Test on the effect of high CO2 at 1C on yellow and red bell peppers
in a flow-through system
Start on 26/10-1995
Assessment 9-11, 13-11 en 16-11-1995

Parameter acceptability

Cont/cond	Assessment	14 d				14+4 d					14+4+3 d				
	Samp	0	1	2	3	Calc	0	1	2	3	Calc	0	1	2	3	Calc
YELLOW																
10 0+21	4	12	3	0	0	0.2	7	8	0	0	0.533	0	13	2	0	1.133
11 0+2	6	10	5	0	0	0.333	11	4	0	0	0.267	0	138	5	2	1.062
9 10+2	2	11	4	0	0	0.267	6	9	0	0	0.6	0	5	7	3	1.867
14 20+2	12	12	3	0	0	0.2	4	11	0	0	0.733	0	2	9	4	2.133
15 0+1	14	12	3	0	0	0.2	5	10	0	0	0.667	0	9	5	1	1.467
12 10+1	8	9	6	0	0	0.4	7	8	0	0	0.533	0	2	9	4	2.133
13 20+1	10	10	5	0	0	0.333	4	11	0	0	0.733	0	3	8	4	2.067
16 0+0	16	13	2	0	0	0.133	2	13	0	0	0.867	0	0	2	13	2.867
RED																
10 0+21	3	13	2	0	0	0.133	9	6	0	0	0.4	4	8	3	0	0.933
11 0+2	5	11	4	0	0	0.267	8	7	0	0	0.467	2	11	2	0	1
9 10+2	1	11	4	0	0	0.267	8	7	0	0	0.467	0	13	2	0	1.133
14 20+2	11	13	2	0	0	0.133	7	8	0	0	0.533	0	9	3	3	1.6
15 0+1	13	12	3	0	0	0.2	7	8	0	0	0.533	0	13	2	0	1.133
12 10+1	7	10	5	0	0	0.333	5	10	0	0	0.667	1	13	1	0	1
13 20+1	9	11	4	0	0	0.267	7	8	0	0	0.533	0	4	8	3	1.933

Parameter pitting

Cont/cond	Assessment after	14 d				14+4 d					14+4+3				
	Samp	0	1	2	3	Calc	0	1	2	3	Calc	0	1	2	3	Calc
YELLOW																
10 0+21	4	15	0	0	0	0	10	3	2	0	0.467	8	5	2	0	0.6
11 0+2	6	15	0	0	0	0	15	0	0	0	0	11	4	0	0	0.267
9 10+2	2	15	0	0	0	0	10	2	3	0	0.533	9	3	2	1	0.667
14 20+2	12	15	0	0	0	0	13	2	1	0	0.25	7	1	3	4	1.267
15 0+1	14	15	0	0	0	0	5	7	3	0	0.867	5	2	6	2	1.333
12 10+1	8	15	0	0	0	0	11	4	0	0	0.267	11	2	1	1	0.467
13 20+1	10	15	0	0	0	0	5	4	6	0	1.067	2	4	4	5	1.8
16 0+0	16	15	0	0	0	0	9	6	0	0	0.4	5	4	5	1	1.133
RED																
10 0+21	3	15	0	0	0	0	15	0	0	0	0	11	4	0	0	0.267
11 0+2	5	15	0	0	0	0	14	0	1	0	0.133	10	3	2	0	0.467
9 10+2	1	15	0	0	0	0	9	4	2	0	0.533	10	4	1	0	0.4
14 20+2	11	15	0	0	0	0	12	2	1	0	0.267	5	6	3	1	1
15 0+1	13	15	0	0	0	0	14	1	0	0	0.067	10	2	3	0	0.533
12 10+1	7	15	0	0	0	0	11	2	2	0	0.4	6	6	2	1	0.867
13 20+1	9	15	0	0	0	0	14	0	1	0	0.133	7	3	3	2	1

Parameter softness

Cont/cond	Assessments after	14 d				14+4 d					14+4+3 d				
	Samp	0	1	2	3		0	1	2	3		0	1	2	3	
10 0+21	4	15	0	0	0	0	15	0	0	0	0	9	5	1	0	0.467
11 0+2	6	15	0	0	0	0	15	0	0	0	0	11	4	0	0	0.267
9 10+2	2	15	0	0	0	0	14	1	0	0	0.067	14	1	0	0	0.067
14 20+2	12	15	0	0	0	0	11	4	0	0	0.267	8	5	2	0	0.6
15 0+1	14	15	0	0	0	0	15	0	0	0	0	12	3	0	0	0.2
12 10+1	8	15	0	0	0	0	15	0	0	0	0	13	1	1	0	0.2
13 20+1	10	15	0	0	0	0	14	1	0	0	0.067	12	2	1	0	0.267
16 0+0	16	15	0	0	0	0	8	5	2	0	0.6	1	5	2	7	2
RED																
10 0+21	3	15	0	0	0	0	15	0	0	0	0	14	1	0	0	0.067
11 0+2	5	15	0	0	0	0	14	1	0	0	0.067	12	3	0	0	0.2
9 10+2	1	15	0	0	0	0	15	0	0	0	0	15	0	0	0	0
14 20+2	11	15	0	0	0	0	12	3	0	0	0.2	7	8	0	0	0.533
15 0+1	13	15	0	0	0	0	15	0	0	0	0	12	3	0	0	0.2
12 10+1	7	15	0	0	0	0	15	0	0	0	0	14	0	1	0	0.133
13 20+1	9	15	0	0	0	0	14	1	0	0	0.067	10	5	0	0	0.333