The Effects of GA_3 and BA on the Keeping Quality of Harvested Cabbages (*Brassica oleracea var capitata)*

By: Fredrick Ouma Ayim

Supervised By: Dr. Musembi N. N./Prof. M. Hutchison,

Coordinated By: Dr. Jane Ambuko

Dept of Plant Sciences and Crop Protection,

Faculty of Agriculture,

University of Nairobi.

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INTRODUCTION

Importance

- Horticultural Industry leading foreign exchange earner
- Vegetables 2nd most important horticultural crop by value
- Cabbages highly consumed vegetable

- Classes of PGRs:
  - Auxins
  - Gibberellins
  - Cytokinins
  - Absissic acid
  - ethylene

Gibberellins

- Synthesis:
  - apical leaf primordia,
  - root tip,
  - developing seeds.
- Functions:
  - cell elongation
  - partial cell division.
  - prevents chlorophyll degradation in some plants.

Cytokinnins

Synthesis:

- Young roots.
- Germinal epithelial cells.

Functions:

- Anti-senescence effects
- Reverses chlorophyll degradation.

Problems statement

- Postharvest Yellowing
- Fresh weight loss
- Loss of turgor
- Impalatability
- Deterioration of display quality
- Decreased shelf life

Justification

- Market is sensitive to shelf life
- Shelf life judged on display quality and palatability
- Both effects are triggered by hormones.
- They require hormonal solutions
- Ethylene known to trigger senescence.
- GA_3 and BA shown to counter Ethylene effects (Musembi, 2008) .

Hypothesis:

H0: No significant difference among the treatment Means.

HA: At least one treatment mean will be different.

Objectives:

Overall Objective

- Investigate effects of GA_3 and BA on the Keeping quality of cabbages.

Specific Objectives

- To investigate water relations in harvested cabbages as influenced by GA_3 and BA.
- To investigate the changes in the chlorophyll contents in harvested cabbages as influenced by GA_3 and BA.

Materials and Methodology

- Site:
  - Crop physiology laboratory UoN.
- Plant Materials:
  - Fresh cabbage heads harvested at hard head stage.

Methodology

- Expt Design- Randomized Block Design
- 3 treatments for each block.
- BA – 4 levels (0ppm, 20ppm,40ppm,60ppm)
- GA_3- 4 levels(0ppm, 1ppm,2ppm,3ppm)
- Negative controls of dionised water and placebo.
- 3 replications.

Layout


GA3
6 Mg/L
BL 2


GA3 4PPM
Bz


GA3 2PPM
B2


CONTROL
NEGATIVE
B2

Response Variates

- Weight loss
- Yellowing/ greenness
- Display qualities
- Wilting
- Chlorophyll content

The experimental procedure follow ed those in *Ambuko, (2001)* and *Musembi, (2008).*

Treatments and Variates

Dependent Variables/Treatments	GA_3	BA	Placebo	Dionised Water
1. Water loss				
2. Leaf Tugor				
3. Fresh Weight				
4. Palatability				
5. Chlorophyll content				

Data Analysis and Presentation

- ANOVA done using GENSTAT®
- Mean separation done using protected mean of 0.0725 LSD

Results

- Variate: %wilting
- Source of variation d.f. s.s. m.s. v.r. F pr.
- block stratum 2 0.00233 0.00117 0.07
- Day 5 514.43200 102.88640 6368.54 <.001
- treat 4 228.99244 57.24811 3543.59 <.001
- Day.treat 20 53.06022 2.65301 164.22 <.001
- Residual 148 2.39100 0.01616

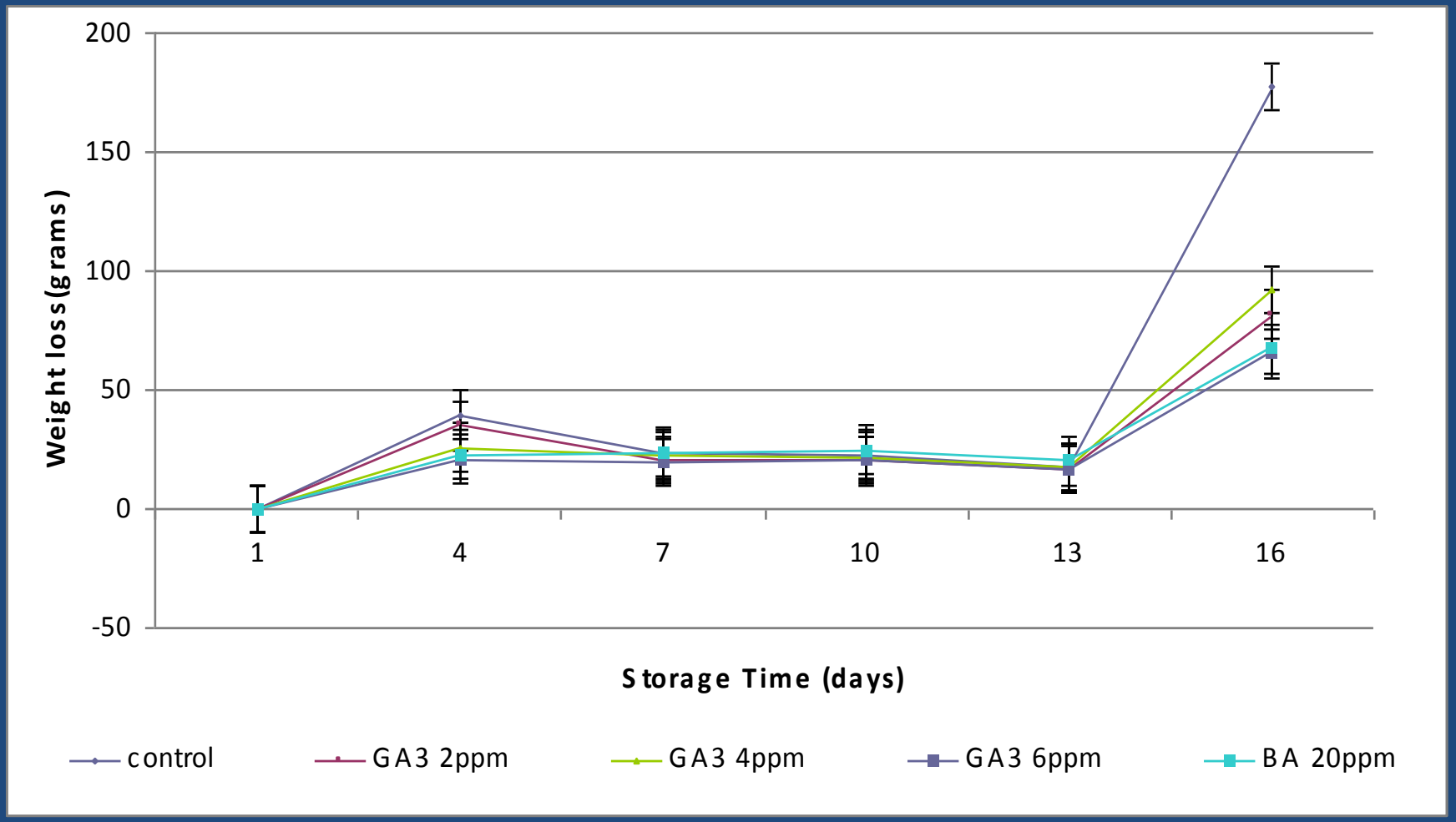

Fig 2. The effects of BA and GA3 on the weight loss during storage of harvested cabbages.

Fig 3. The effects of BA and GA3 doses on the loss in weight during storage of harvested cabbages.

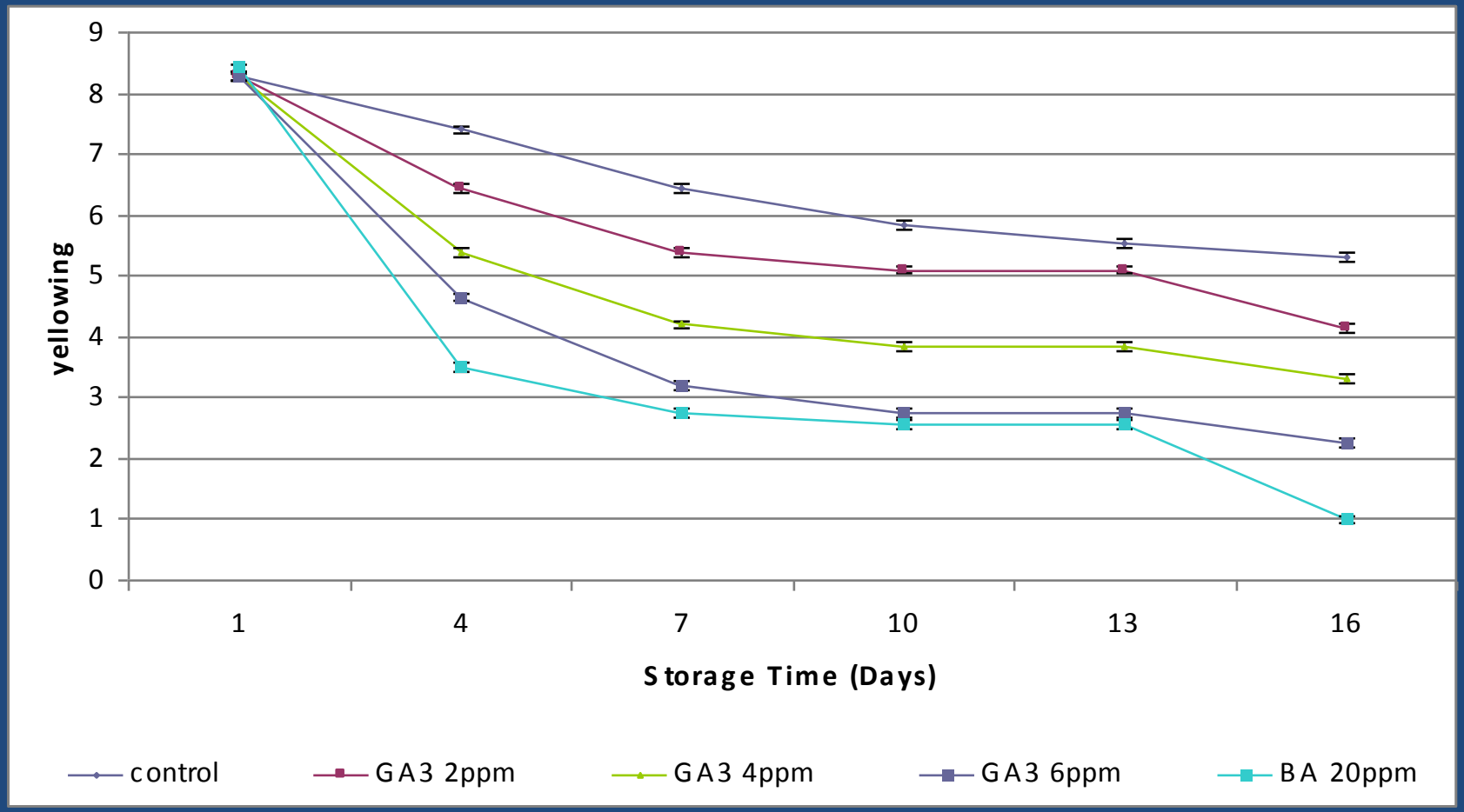

Fig 1. The effects of BA and GA3 on the rate of yellowing during storage of harvested cabbages.

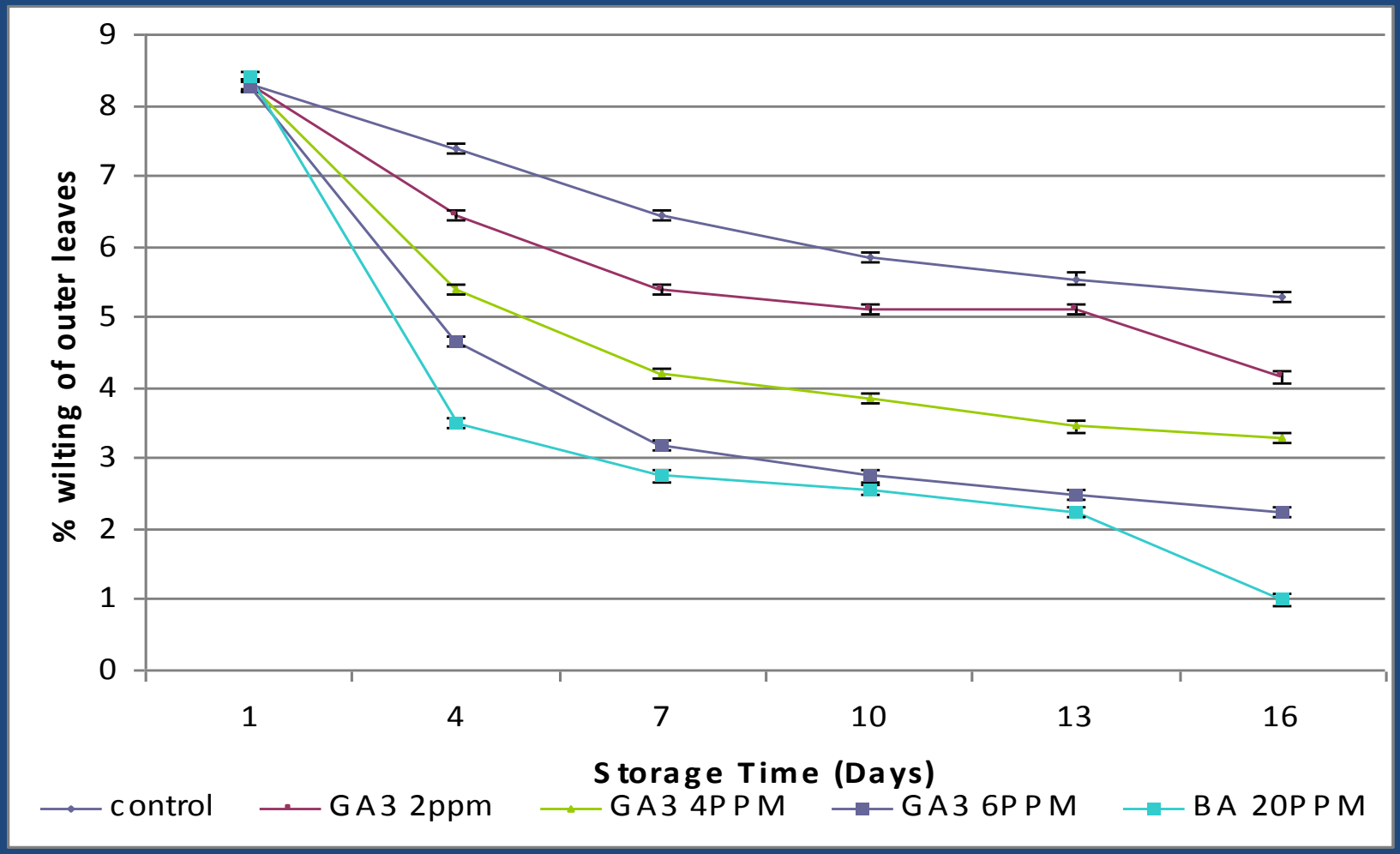

Fig 3. The effects of BA and GA3 doses on the rate of wilting of outer leaves of harvested cabbages.

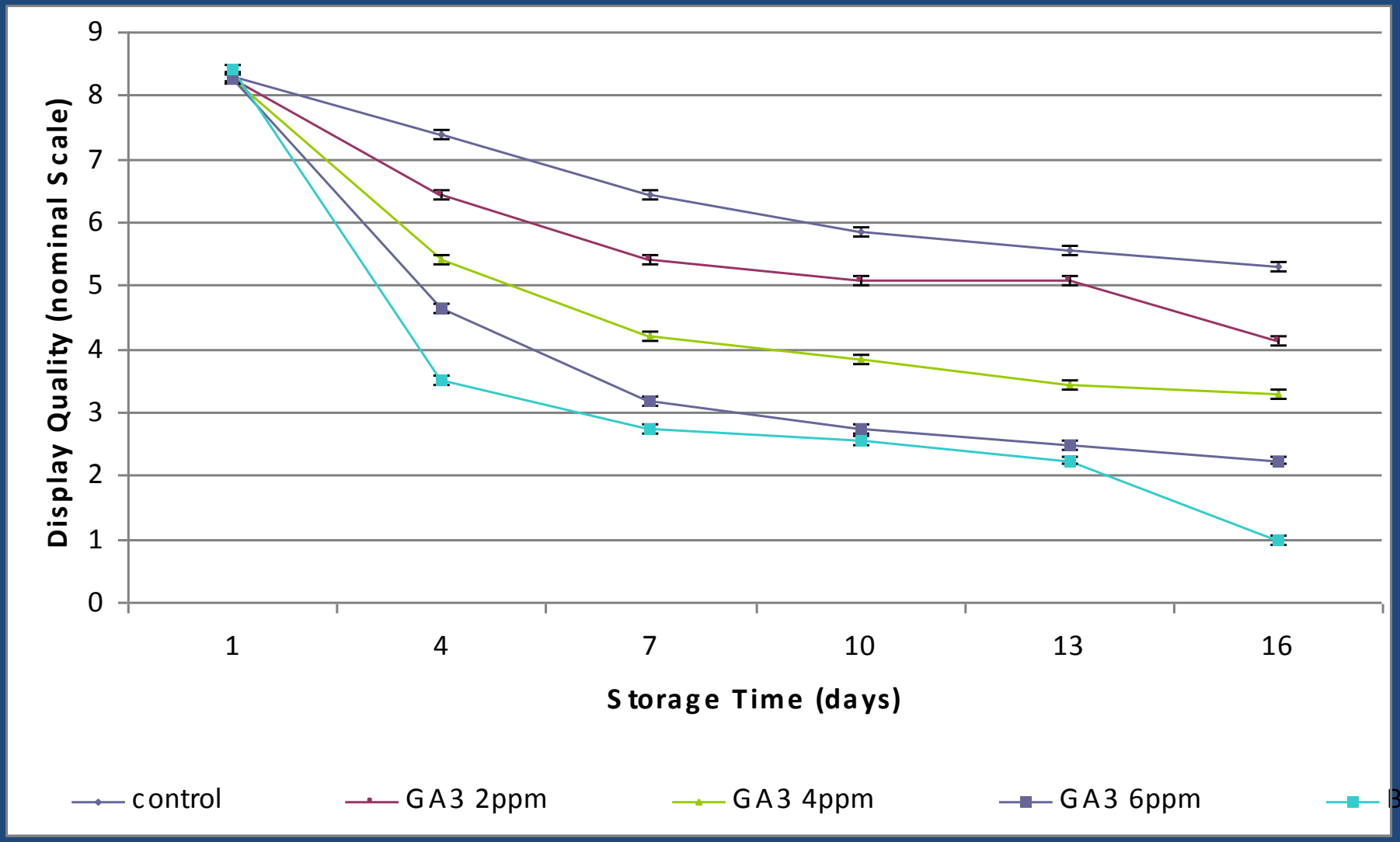

Fig 4. The effects of BA and GA3 doses on the reduction of display quality of harvested cabbages.

Conclusion and Recommendations

- Both the BA and GA3 treatments had a significant difference from the control.
- Hormonal treatments can be used to extend the shelf life of cabbages
- BA and GA3 can improve the keeping quality of cabbages.
- Further research on the efficacy, the exact duration.

THANK YOU!