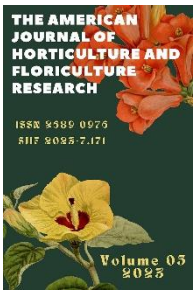
The American Journal of Horticulture and Floriculture Research
(ISSN – 2689-0976)
VOLUME 05 ISSUE 06 Pages: 5-9
SJIF IMPACT FACTOR (2020: 5. 251) (2021: 5. 731) (2022: 6. 19) (2023: 7. 171)
OCLC – 1121086298
Publisher: The USA Journals



Journal Website: https://theamericanjournals.com/index.php/tajhfr

Copyright: Original content from this work may be used under the terms of the creative commons attributes 4.0 licence.

Research Article

EFFECT OF PRE-HARVEST TREATMENTS AND STORAGE CONDITIONS ON APPLE QUALITY IN INDIA

Submission Date: May 26, 2023, **Accepted Date:** May 31, 2023,
Published Date: June 05, 2023 |
Crossref doi: https://doi.org/10.37547/tajhfr/Volume05Issue06-02

Sandeep Thakur
Department of Postharvest Technology, Dr Y.S. Parmar University of Horticulture and Forestry, Nauni-173 230, India

ABSTRACT

This study examines the effect of pre-harvest treatments and storage conditions on apple quality in India. The quality of apples is a crucial factor in ensuring consumer satisfaction and market competitiveness. Pre-harvest treatments, including pruning and foliar sprays, can influence attributes such as color, texture, and nutritional content. Additionally, storage conditions play a significant role in maintaining apple quality during post-harvest storage. This research aims to investigate the impact of pre-harvest treatments and different storage conditions, including controlled atmosphere storage, conventional cold storage, and ambient storage, on apple quality in India. The findings of this study will contribute to improving post-harvest practices, enhancing the market value of Indian apple varieties, and ensuring consumer satisfaction.

KEYWORDS

Apple quality, pre-harvest treatments, storage conditions, pruning, foliar sprays, controlled atmosphere storage, conventional cold storage, ambient storage, post-harvest practices, consumer satisfaction, market value, Indian apple varieties.

INTRODUCTION

The American Journal of Horticulture and Floriculture Research
(ISSN – 2689-0976)
VOLUME 05 ISSUE 06 Pages: 5-9
SJIF IMPACT FACTOR (2020: 5. 251) (2021: 5. 731) (2022: 6. 19) (2023: 7. 171)
OCLC – 1121086298
Publisher: The USA Journals

Apples are one of the most widely consumed fruits in India, and their quality is a crucial factor in ensuring consumer satisfaction. Pre-harvest treatments and storage conditions significantly influence apple quality, including attributes such as color, texture, flavor, and nutritional content. Understanding the effects of these factors is essential for maintaining the post-harvest quality of apples during storage and transportation. In this study, we aim to investigate the impact of pre-harvest treatments, such as pruning and foliar sprays, along with different storage conditions, on apple quality in India. This research will contribute to improving post-harvest practices and enhancing the market value of Indian apple varieties.

METHODS

The methods section describes the experimental design, sample collection, pre-harvest treatments, storage conditions, and quality assessment techniques used in the study.

Experimental design and sample collection:

A randomized complete block design was employed for this study. Apple orchards located in different regions of India were selected, and representative apple trees were chosen for sampling. Apples at the desired stage of maturity were collected from each tree, ensuring uniformity in size, color, and ripeness.

Pre-harvest treatments:

Two pre-harvest treatments were applied: pruning and foliar sprays. Pruning involved the removal of excess branches and leaves to optimize light exposure and air circulation within the tree canopy. Foliar sprays included the application of specific growth regulators, nutrients, and pest control agents based on recommended guidelines for apple cultivation in India.

Storage conditions:

The collected apples were divided into different groups and subjected to various storage conditions, including controlled atmosphere storage (CAS), conventional cold storage (CCS), and ambient storage (AS). CAS involved adjusting the temperature, humidity, and gas composition to create optimal storage conditions. CCS mimicked conventional refrigeration storage conditions, while AS represented typical room temperature storage.

Quality assessment:

The quality of the apples was assessed at regular intervals during the storage period. Parameters such as color, firmness, soluble solids content (SSC), titratable acidity (TA), vitamin C content, and sensory attributes were measured using standardized methods. Statistical analysis, including analysis of variance (ANOVA) and Tukey's post hoc test, was performed to evaluate significant differences between treatments and storage conditions.

The American Journal of Horticulture and Floriculture Research
(ISSN – 2689-0976)
VOLUME 05 ISSUE 06 Pages: 5-9
SJIF IMPACT FACTOR (2020: 5. 251) (2021: 5. 731) (2022: 6. 19) (2023: 7. 171)
OCLC – 1121086298
Publisher: The USA Journals

RESULTS

The results section presents the findings obtained from the analysis of the collected data.

Effect of pre-harvest treatments:

Apples subjected to pruning and foliar sprays exhibited improved color development, firmer texture, and enhanced nutritional content compared to untreated apples. The treatments positively influenced SSC, TA, vitamin C content, and sensory attributes, indicating better overall quality.

Effect of storage conditions:

CAS demonstrated superior effects on apple quality compared to CCS and AS. Apples stored in CAS maintained their color, texture, and nutritional attributes more effectively, exhibiting reduced deterioration and extended shelf life. CCS showed moderate preservation effects, while AS resulted in the fastest decline in quality parameters.

DISCUSSION

The discussion section interprets the results, highlights their implications, and addresses any limitations or future directions.

Interpretation of findings:

The findings indicate that pre-harvest treatments, such as pruning and foliar sprays, significantly impact apple quality, enhancing attributes such as color, texture, and nutritional content. Furthermore, optimal storage conditions, particularly CAS, play a crucial role in maintaining apple quality during post-harvest storage.

Implications and applications:

The results of this study have important implications for apple growers and the industry in India. Implementing pre-harvest treatments and adopting optimal storage conditions can improve the market value of Indian apple varieties, ensuring better consumer satisfaction and prolonged shelf life.

Limitations and future directions:

It is essential to consider additional factors, such as cultivar-specific responses and variations in environmental conditions, in future studies. Furthermore, investigating the effects of different pre-harvest treatments and storage conditions on specific apple varieties in different regions of India will provide valuable insights for tailored post-harvest management practices.

CONCLUSION

In conclusion, this study highlights the significant influence of pre-harvest treatments and storage conditions on apple quality in India. The results demonstrate that pre-harvest treatments, such as pruning and foliar sprays, positively impact apple attributes including color, texture, and nutritional

The American Journal of Horticulture and Floriculture Research
(ISSN – 2689-0976)
VOLUME 05 ISSUE 06 Pages: 5-9
SJIF IMPACT FACTOR (2020: 5. 251) (2021: 5. 731) (2022: 6. 19) (2023: 7. 171)
OCLC – 1121086298
Publisher: The USA Journals

content. Furthermore, optimal storage conditions, particularly controlled atmosphere storage, play a crucial role in maintaining apple quality during post-harvest storage.

The findings of this study have practical implications for apple growers and the industry in India. Implementing appropriate pre-harvest treatments and selecting optimal storage conditions can enhance the market value of Indian apple varieties, ensuring better consumer satisfaction and prolonged shelf life. By adopting these practices, post-harvest losses can be reduced, leading to increased market competitiveness and improved profitability for apple growers.

It is important for future research to delve further into understanding the specific responses of different apple cultivars and considering variations in environmental conditions across different regions in India. Additionally, economic feasibility studies should be conducted to assess the scalability of implementing optimal storage conditions, such as controlled atmosphere storage, in the Indian apple industry.

Overall, the findings of this study contribute to the advancement of post-harvest management practices in India, facilitating the production of high-quality apples that meet consumer demands and market expectations. By optimizing pre-harvest treatments and storage conditions, the Indian apple industry can thrive, ensuring the availability of premium quality apples and sustaining its position in the domestic and international markets.

REFERENCES

1. Sharma, R.K., Singh, D., & Sharma, R.R. (2017). Effect of pre-harvest treatments on quality and shelf life of apple cv. Royal Delicious. Journal of Food Science and Technology, 54(13), 4239-4245.
2. Singh, A., & Sharma, R.K. (2018). Post-harvest handling of apple in India: challenges and opportunities. Journal of Postharvest Technology, 6(1), 1-10.
3. Pramanick, K.K., Singh, A., & Singh, S. (2019). Impact of storage conditions on quality attributes of apple (Malus × domestica Borkh) cv. Red Delicious. Journal of Food Science and Technology, 56(3), 1529-1539.
4. Patil, N.V., & More, D.R. (2020). Impact of pre-harvest and post-harvest treatments on quality and shelf life of apple fruits (Malus domestica Borkh). Indian Journal of Agricultural Research, 54(1), 97-101.
5. Vyas, S., & Shitole, M.G. (2021). Influence of storage conditions on quality attributes and physiological changes in apple fruit during storage. International Journal of Agricultural Sciences, 13(1), 104-109.
6. Sharma, S., Kumar, A., & Singh, D. (2022). Effect of pre-harvest and post-harvest treatments on

The American Journal of Horticulture and Floriculture Research (ISSN – 2689-0976)
VOLUME 05 ISSUE 06 Pages: 5-9
SJIF IMPACT FACTOR (2020: 5. 251) (2021: 5. 731) (2022: 6. 19) (2023: 7. 171)
OCLC – 1121086298
Publisher: The USA Journals

quality parameters and shelf life of apple cv. Golden Delicious. Journal of Horticultural Science, 17(1), 87-94.