



Performance of Different Aglaonema (*Aglaonema commutatum*) Varieties under Prayagraj Agro-climatic Conditions

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: <https://doi.org/10.9734/ijpss/2024/v36i84833>

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/120224>

Original Research Article

Received: 10/05/2024

Accepted: 12/07/2024

Published: 16/07/2024

ABSTRACT

The present investigation was undertaken in the Department of Horticulture, Sam Higginbottom University of Agriculture, Technology And Sciences, Prayagraj, during August, 2023 to April, 2024. The experiment was laid out in completely randomized design with eight different aglaonema varieties viz., Dove, Earnest Round Leaf, Watson Dwarf, Butterfly, Ice, Red Lipstick, Nitidum and Rotundum, replicated thrice and carried out under 50% shade net conditions. Variety Butterfly reported significantly better performance compared to other varieties in terms of growth parameters like plant height (48.6 cm), number of leaves (5.4), plant spread (31.2 cm²), stem girth (5.7 cm), leaf area (129.6 cm²), minimum leaf production interval (12.6 days), number of new sprouts (7), chlorophyll content (21.6), plant growth index based on height of the plants (7.5), plant growth index based on number of leaves (12.6) and survival percentage (100%).

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Cite as: S, Alby, and Urfi Fatmi. 2024. "Performance of Different Aglaonema (*Aglaonema Commutatum*) Varieties under Prayagraj Agro-Climatic Conditions". *International Journal of Plant & Soil Science* 36 (8):41-44. <https://doi.org/10.9734/ijpss/2024/v36i84833>.

Keywords: *Aglaonema*; performance; shade net; varieties.

1. INTRODUCTION

Aglaonema, derived from the Greek words 'aglaos' (shining) and 'nema' (thread), is a genus renowned for its visually appealing foliage [1]. These plants are widely utilized in homes, offices, and public spaces and enhance interior decor through their varied shapes, sizes, and colors, thereby creating aesthetically pleasing and soothing environments [2]. They also significantly contribute to urban ecosystems by providing habitat for a variety of wildlife, including birds and insects thus, promoting biodiversity even in densely populated areas.

Aglaonema is a versatile and resilient plant that enhances indoor environments with both aesthetic appeal and health benefits. Its capacity to thrive in low light conditions and its low maintenance requirements make it an ideal choice for both novice and experienced gardeners [3]. The adaptability to indoor conditions, coupled with its ability to improve air quality, makes *aglaonema* a valuable addition to homes and workplaces, contributing to a healthier and more visually pleasing environment. So, considering the importance of this crop in urban landscape, this research was aimed to investigate the most suitable *aglaonema* variety for survival, establishment, growth and development under Prayagraj agro-climatic conditions

2. MATERIALS AND METHODS

The investigation was carried out under 50% shade net house conditions in Horticultural Research Field, Department of Horticulture, Naini Agricultural Institute, SHUATS, Prayagraj, during 2023-2024. The experiment was laid out in Completely Randomized Design (CRD) with 8 varieties and each variety replicated thrice. The experimental material consisted of *aglaonema* varieties viz., V1-*Aglaonema* Dove, V2-*Aglaonema* Earnest Round Leaf, V3- *Aglaonema* Watson Dwarf, V4- *Aglaonema* Butterfly, V5-*Aglaonema* Ice, V6- *Aglaonema* Red Lipstick, V7- *Aglaonema* Nitidum, and V8- *Aglaonema* Rotundum. The data recorded during the experiment were subjected to statistical analysis by using analysis of variance (ANOVA).

3. RESULTS AND DISCUSSION

3.1 Growth Performance of Different *Aglaonema* Varieties

Significant variations were observed among the eight *aglaonema* varieties studied across all the growth parameters, presented in Table 1. Significantly taller plants (48.6 cm) were observed in variety V4 (Butterfly) followed by variety V5 (Ice, 46.0 cm) while shorter plants (37.8 cm) was recorded in variety V7 (Nitidum). Significantly more number of leaves (5.4) were observed in variety V4 (Butterfly) followed by variety V5 (Ice, 5.1) while lesser number of leaves per plant (2.5 cm) was recorded in variety V7 (Nitidum). More plant spread (31.2 cm) was observed in variety V4 (Butterfly) followed by variety V5 (Ice, 29 cm) while lesser plant spread (17.7 cm) was observed in variety V6 (Red Lipstick). Significantly more stem girth (5.7cm) was observed in variety V4 (Butterfly) was followed by variety V5 (Ice, 5.3cm) and the lesser stem girth was observed in variety V7 (Nitidum, 3.4 cm). Significantly bigger estimated leaf area (129.56 cm²) was observed in variety V4 (Butterfly) followed by variety V1 (Ice, 94.5 cm²) while smaller estimated leaf area (48.8 cm²) was observed in variety V6 (Red Lipstick).

The variation in plant height, number of leaves, plant spread, stem girth and leaf area can be attributed to genetic differences, growth rates, and environmental conditions. Variation in plant height and number of leaves per plant are driven by differences in the rate of vegetative growth among the genotypes. The plant spread and the leaf area is crucial for photosynthetic activity as it enhances the interception of solar energy, significantly influencing growth and flower yield. This observation is supported by studies conducted by Srinivasa and Reddy [4], Femina et al. [5], Rajeevan et al. [6] and Agasimani et al. [7] in *Anthurium*, who similarly reported the importance of plant spread in maximizing photosynthetic efficiency and overall plant productivity. Varieties like Butterfly and Ice may have genetic traits that promote thicker stem growth, resulting in larger girth measurements. Varieties adapted to favourable conditions are likely to exhibit better growth and thicker stems compared to those less adapted or facing growth-limiting conditions [8].

Table 1. Growth performance of different Aglaonema varieties

Variety	Plant height* (cm)	Number of leaves*	Plant spread* (cm ²)	Stem girth* (cm)	Leaf area (cm ²)
V1 – Dove	40.5	3.5	24.2	4.3	94.5
V2 - Earnest Round Leaf	43.4	4.1	19.1	4.5	89.8
V3 - Watson Dwarf	39.7	4.7	25.5	4.7	68.6
V4 – Butterfly	48.6	5.4	31.2	5.7	129.6
V5 – Ice	46.0	5.1	29.0	5.3	54.7
V6 - Red Lipstick	39.2	3.9	17.7	4.7	48.8
V7 - Nitidum	37.8	2.5	21.6	3.4	84.3
V8 - Rotundum	-	-	-	-	-
F- TEST	S	S	S	S	S
SE.d (±)	0.32	0.21	0.37	0.2	1.54
CD0.05	0.69	0.45	0.79	0.5	3.3
CV	1.13	6.05	1.87	5.9	2.31

*240 Days after planting

Table 2. Survival and establishment performance of different Aglaonema varieties

Variety	Chlorophyll content	Plant Growth Index (based on plant height)	Survival percentage (%)
V1 - Dove	23.0	3.8	73.3
V2 - Earnest Round Leaf	20.0	3.8	60
V3 - Watson Dwarf	29.6	5.5	66.6
V4 - Butterfly	21.6	7.5	100
V5 - Ice	35.6	6.4	100
V6 - Red Lipstick	4.2	5.6	80
V7 - Nitidum	68.2	3.4	86.5
V8 - Rotundum	-	-	-
F- TEST	S	S	S
SE.d (±)	0.3	0.13	4.23
CD0.05	0.65	0.28	9.07
CV	1.29	3.13	6.4

3.2 Survival and Establishment Performance of Different Aglaonema Varieties

From the present investigation, it is concluded that significant variations were observed among the eight aglaonema varieties studied across all the survival and establishment performance and the data is presented in Table 2. Significantly higher chlorophyll content (68.2 mg/g) was observed in variety V7 (Nitidum) followed by variety V5 (Ice, 35.56 mg/g) lower chlorophyll content (4.20 mg/g) was observed in variety V6 (Red Lipstick). Significantly higher plant growth index based on plant height was recorded in variety V4 (Butterfly, 7.5) followed by variety V5 (Ice, 6.4) whereas lesser plant growth index was observed in V7 (Rotundum, 3.4) Significantly higher survival and establishment percentage was observed in variety V4 and V₅ (Butterfly, 100% & Ice, 100%) followed by variety V7 (Nitidum, 86.5%), while lower survival and

establishment percentage (60%) observed in variety V2 (Earnest Round Leaf).

The variation in chlorophyll content, higher plant growth index and survival and establishment percentage of different varieties might be attributed to adaptability of different varieties having different genetic makeup which give different response to a given environmental conditions of a specific location. Variation in SPAD value among the varieties is primarily influenced by genetic traits and environmental conditions. Genetic variations play a significant role as each variety possesses distinct traits that affect chlorophyll synthesis and metabolism [9]. Varieties that are well-suited to the prevailing environmental conditions and receive optimal care during establishment are more likely to achieve higher survival rates. These results are in conformity with Femina et al. [5], Rajeevan et al. [6] and Agasimani et al. [7] in the crop anthurium.

4. CONCLUSION

On the basis of the research trial conducted on aglaonema (*Aglaonema commutatum schott*) under 50% shade net conditions, it is concluded that variety V4 (Butterfly) performed significantly better in terms of plant height, stem girth, leaf area, plant spread, number of leaves, plant growth index based on plant height per plant, plant growth index based on number of leaves per plant, survival rate and establishment.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Authors hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/120224>