**Comparative Evaluation of China Aster Varieties in the Wayanad District of Kerala, India**

# Abstract:

China aster holds a selective position among the diverse array of commercial flower crops due to its beauty, elegance, varied forms and appealing color ranges conditions. The farmers lack awareness regarding the cultivation and market demand for China aster. China aster can be utilized to adorn interiors, create bouquets, and distinctive garlands, contributing to an overall aesthetic in landscape gardening. In order to increase the cultivation, the experiment was conducted during 2019-20, at Krishi Vigyan Kendra, Wayanad and the main aim of the study was to investigate the performance of various genotypes of China aster in the Wayanad areas. As per the observation number of flowers per plant and branches was highest in the variety Arka Archana (78.10) (18.26). Arka Aadya showed minimum days of flowering (111.25 days) and the maximum days (142.54 days) was recorded in variety Arka Poorima .The yield was highest in Arka Archana (170 q/ha) followed by Arka Aadya (130 q/ha) the variety.

**Keywords**: *Aster, commercial flower, cultivars, Wayanad*.

# Introduction

China aster (*Callistephus chinensi* (L.) Nees), a member of the ‘Asteraceae’ family, is native to China and is one of the most beautiful and diverse flowers (Biswas *et al, 2021*). The color spectrum includes pure white, various shades of pink, pale blue, purple, dark blue, and scarlet which is one of the garden's most attractive flowers (Abrol *et al*, 2019 and Dharmendra *et al*, 2019). It is among the most significant annual flower crops cultivated globally (Siddappa *et al*, 2018). Among annual flowers, it holds the third position after chrysanthemum and marigold (Bose *et al,* 2018). In India, it is traditionally cultivated for loose and cut flowers, hair adornments, floral garlands, decorations, bouquets, mixed herbaceous borders and bedding plant arrangements (Abrol *et al,* 2019). Due to its short height, broad colour palette, longer vase life and capacity to endure rough handling during transport, it has become quite significant in the flower trade (Chaitra and Patil, 2007). Aster is a short-duration crop that has adapted to different agro-climatic condition and it is deemed appropriate for intercropping within coconut gardens (Bose *et al*.,2018).The crop is primarily cultivated in India within the states of Karnataka, Maharashtra, Tamil Nadu, West Bengal and Andhra Pradesh (Santhosh *et al,* 2020). A temperature 20- 30oC during day and 15-17oC during night with relative humidity of 50-60% is most suitable for best colour development of flowers(Kumar *et al*.,2019). Despite the climate being favorable, aster is not cultivated in

Wayanad district. This study is important for the scientific community because it provides useful information about growing China aster in Wayanad. Many farmers are not aware of how to cultivate this flower or its market demand. The findings of this research can help farmers choose the best variety for better yield and early flowering. It also gives valuable insights to scientists, agricultural officers, and policymakers to improve flower farming and make it more profitable. The quality of flowers is primarily a varietal trait, besides being influenced by nutritional and climatic conditions that prevail during the growing period [3]. It is therefore essential to study the performance of cultivars in a particular place before recommending for commercial cultivation Therefore, a varietal evaluation is conducted to select suitable varieties of China aster based on their performance in this district during the winter season.

# Materials and methods:-

A field experiment on evaluation of China aster [Callistephus chinensis (L.) Nees] varieties for the growth, yield and quality parameters under Wayanad conditions was conducted at the farm of Krishi Vigyan Kendra in the month of October to February during the winter season of the year 2019-2020. The experiment was laid out in Randomised Block Design with five replications. The experiment has been under taken in open field conditions. For conducting the experiment four genotypes of China aster were selected for the study *viz*., Arka Kamini (**T1**), Arka Poornima (**T2**), Arka Aadya (**T3**), and Arka Archana (T4). The nursery trays were prepared with a well-aerated mixture of sand, soil, and well-rotted farmyard manure (FYM) in equal proportions (1:1:1, v/v). The nursery was raised and one month old healthy seedlings without any pest and diseases, and of consistent size and vigor at the 3-4 leaf stage, were carefully chosen and transplanted in the open field after three to four time ploughing and planted at the spacing of 30x30 cm. Farmyard manure, NPK are applied as per the KAU recommendations and irrigated depending upon the soil and weather condition. Growth observations were documented in five plants that were randomly chosen from each treatment. The plant height was measured from the ground level to the tip of the plant after transplanting and was expressed in centimeters. The numbers of primary as well as secondary branches were counted from individual plant and the average was worked out. Number of flowers produced from the five tagged plants was recorded and the average number of flowers produced per plant was worked out. After recording the number of flowers per plant, all the flowers were weighed separately at every harvest till the final harvest and the average flower yield per plant was calculated and expressed in grams per plant. Significant differences were noted for growth parameters such as plant height (cm), number of branches per plant (no.s), number of flowers per plant (no.s), flower diameter (cm) and yield (q/ha), which were measured continuously and measurement was taken by measuring scale. Floral characters were noted at the time of flower harvesting, when they had fully opened, while vegetative characters were recorded every month. The data on performance of selected cultivars of China aster for various vegetative parameters, floral characters and yield were collected. Statistical analysis for analysis of variance was followed according to the method described by Panse and Sukhatme (1985) and B:C ratio of each variety was also worked out.

**Table: 1 Assessment of China Aster in Wayanad Conditions on the basis of plant height, spike length, number of floret/spike, floret diameter, spike yield and B: C ratio suitable for Wayanad.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Treatment** | **Plant height (cm)** | **No. of Branches (no.s)** | **Days required for flowering****(no.s)** | **No. of flowers per plant****(no.s)** | **Floret diameter (cm)** | **Yield (q/ha)** | **B:C****Ratio** |
| **T1** | 42.37 | 11.51 | 128.20 | 56.60 | 6.10 | 100.00 | 1.77 |
| **T2** | 51.23 | 9.13 | 142.54 | 38.00 | 5.83 | 90.00 | 1.60 |
| **T3** | 33.72 | 10.33 | 111.25 | 52.30 | 5.60 | 130.00 | 2.30 |
| **T4** | 49.20 | 18.26 | 119.83 | 78.10 | 5.50 | 170.00 | 3.00 |
| **Mean** | **44.13** | **12.31** | **125.46** | **56.25** | **5.76** | **122.50** | **2.17** |
| **CV %** | **2.10** | **2.30** | **2.03** | **2.25** | **2.00** | **2.26** | **2.25** |
| **CD (0.05)** | **1.28** | **0.39** | **3.52** | **1.75** | **0.16** | **3.81** | **0.07** |

# Results and Discussion

The results obtained from observing various parameters of four different types of China aster are explained as follows. Considerable variation in vegetative growth was noted among the different genotypes. The highest plant height was recorded in the variety Arka Poornima (51.23 cm) followed by Arka Archana (49.20cm) and Arka Kamini (42.37cm) and the lowest height is observed in the variety Arka

Aadya (33.72 cm). Differences in plant height could be attributed to the genetic variation present within the variety similar to the findings of Santhosh *et al*., 2020 in China aster. The architecture of the plant and the flower count per plant are influenced by the number of primary branches. In the current investigation, the highest number of branches was noted in variety Arka Archana (18.26) followed by Arka Kamini (11.51) which is on par with Arka Aadya (10.33) and the lowest number of branches is observed Arka

With regard to various floral traits, a considerable difference was observed among the varieties. The days taken for flowering was indicated the flowering habit of the varieties and was under genetic control. Early flowering was observed in variety Arka Aadya (111.25 days followed by Arka Archana (119.83 days) which was on par with varieties Arka Kamini (128.20 days), and the longest days for flowering is observed in variety Arka Poornima (142.54 days). The number of flowers per plant varied significantly among the different varieties, with the highest count observed in the Arka Archana (78.10) variety followed by Arka Kamini (56.60) and the lowest count is observed in the variety Arka Poornima (38.00). Variation in flower yield was observed previously in China aster by Swati *et al*, 2023.

**Fig: 1 Graphical representation of vegetative and reproductive characters and yield parameters of**

 **China Aster**

Poornima (9.13).

The maximum flower diameter was recorded in Arka Kamini (6.10 cm) followed by Arka Poornima (5.83cm) and minimum in Arka Archana (5.50 cm). These results were consistent with the earlier findings of (Biswas *et al* 2021). The large-sized flowers could be the reason for the increased yield. Similar findings were reported by Kulkarani and Reddy (2006) in China aster. The rise in the number of flowers per plant and the flower yield per acre may be attributed to the indirect influence of having more branches. Similar result among the China aster varieties was also reported by Chavan *et al* (2010).

# Conclusion

Based on the data in this study, it can be concluded that, among the four different varieties of China aster, the variety Arka Archana (T4) showed better performance in terms of number of branches/plant, number of flowers/plant and yield .Farmers were satisfied by the performance of aster in wayanad conditions and they are ready to further cultivate the crop. The studies revealed that Arka Archana and Arka Aadhya are superior in respect of vegetative growth and flower yield. It is essential to conduct additional research on irrigation, fertilizers and plant growth regulators to assess performance and endorse these varieties for commercial cultivation in Wayanad regions.

**Disclaimer (Artificial intelligence**)

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

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