

## International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693  
 ISSN Online: 2617-4707  
 IJABR 2024; SP-8(2): 526-528  
[www.biochemjournal.com](http://www.biochemjournal.com)  
 Received: 01-11-2023  
 Accepted: 07-01-2024

**Rinu**  
 Department of Floriculture  
 and Landscape Architecture,  
 Pt. Kishori Lal Shukla College  
 of Horticulture and Research  
 Station, Rajnandgaon,  
 Chhattisgarh, India

**Dr. Sushila**  
 Department of Agriculture  
 Economics, Pt. Kishori Lal  
 Shukla College of Horticulture  
 and Research Station,  
 Rajnandgaon, Chhattisgarh,  
 India

**Siddharth Kumar**  
 Department of Agri-Business  
 and Rural Management,  
 College of Agriculture, IGKV,  
 Raipur, Chhattisgarh, India

**Akash Chandra**  
 Department of Floriculture  
 and Landscape Architecture,  
 College of Agriculture, IGKV,  
 Raipur, Chhattisgarh, India

**Corresponding Author:**  
**Rinu**  
 Department of Floriculture  
 and Landscape Architecture,  
 Pt. Kishori Lal Shukla College  
 of Horticulture and Research  
 Station, Rajnandgaon,  
 Chhattisgarh, India

## Experimental economic characterization of China aster (*Callistephus chinensis* L.) under Rajnandgaon District of Chhattisgarh

**Rinu, Dr. Sushila, Siddharth Kumar and Akash Chandra**

**DOI:** <https://doi.org/10.33545/26174693.2024.v8.i2Sg.623>

### Abstract

The present experiment entitled “Varietal Evaluation of China aster under Rajnandgaon district of Chhattisgarh” was carried out in the Department of Floriculture and Landscape Architecture at Pt. Kishori Lal Shukla College of Horticulture and “Research Station, Pendri Farm Rajnandgaon (C.G.) during the year 2019-20. The experiment was laid out in six varieties of China aster with four replications in randomized block design. The cv. Phule Ganesh White recorded maximum vase life (8.65 days) followed by varieties Arka Shashank (6.33 days), Arka Kamini (5.98 days) and Arka Archana (5.70 days). Whereas, minimum vase life was obtained in the cv. Arka Poornima (5.15 days). The economics of cultivation of different China aster varieties has revealed that out of the treatments in cultivation of China aster, among the cultivar Phule Ganesh White recorded higher revenue of Rs. 3,00,000 and a net profit of Rs. 2,29,689 with cost benefit ratio of 1: 3.26.

**Keywords:** Experimental, economic, characterization, *Callistephus chinensis* L.

### Introduction

China aster (*Callistephus chinensis* L.) belongs to ‘Asteraceae’ family and is native to China. It is one of the most important annual flower crops grown in most parts of the world. Among annual flowers, it ranks third next only to Chrysanthemum and Marigold. Increased flower quantity and quality with perfection in the form of plants are important objectives to be reckoned in commercial flower production. Although, there are sufficient number of cultivars under cultivation but their performance are region specific and varies from place to place. The cultivars Violet Cushion, Kamini, and Local are being cultivated to a limited extent in and around Hyderabad. However, the Phule Ganesh series, in spite of their superior yield and quality traits, have not been tried under Hyderabad conditions. The quality of flowers is primarily a varietal trait, besides being influenced by nutritional and climatic conditions that prevail during the growing period. It is therefore essential to study the performance of cultivars in a particular place before recommending for commercial cultivation. In view of these, an investigation was conducted to study the growth, flowering and yield characters of some China aster cultivars under Hyderabad conditions.

The genus *Callistephus* is derived from two Greek words *Kalistos* meaning ‘most beautiful’ and *Stephus*, ‘a crown’ referring to the flower head. It is a half hardy annual flower crop with the basic chromosome number of  $n=9$  but most of the species are diploid in nature i.e.,  $2n=18$ . The aster bloom consist two kinds of florets: ray florets and disc florets. The disc florets are short while the ray florets are usually long. The most suitable character for the classification of China aster is by the shape of ray florets. Having the potentiality to adapt well to varying soil and climatic conditions, it can be grown successfully under different agro-climatic conditions like India, France, Germany, Netherlands, U.K., Siberia, Russia, Japan, North America, Switzerland and Europe. In India, China aster is largely grown on commercial scale by the farmers in southern states like Karnataka, Tamil Nadu, Andhra Pradesh, Maharashtra and West Bengal. It ranks third next to Chrysanthemum and Marigold, among the annual flowers. Floral biology of China aster was described by Strube (1965) [5]. Estimated approximately 10 percent natural crossing in China aster. North (1979) grouped China aster under self-pollinated crops.

In India, breeding in China aster was first pioneered by S.S. Negi and S.P.S Raghava during 1984-85 which resulted in development of many improved varieties. Although, China aster is being grown in considerable areas, its cultivation is concentrated around big cities and there is a need to popularize under different agro-climatic conditions and the deterioration of flower seed quality very quickly. The present investigation has been carried out with an objective Although, China aster is being grown in considerable areas, its cultivation is concentrated around big cities and there is a need to popularize under different agro-climatic conditions. The present investigation has been carried out to evaluate the variation in seed production potential of China aster.

### Materials and Methods

The experiment was conducted at the Department of Floriculture and Landscape Architecture at Pt. Kishori Lal Shukla College of Horticulture and "Research Station, "Pendri" Farm, Rajnandgaon (C.G.) during the year 2019-20. The study consisted of seven cultivars viz; Arka Kamini, Arka Poornima, Arka Shashank, Arka Archana, Phule Ganesh Pink, and Phule Ganesh White. Standard cultivation and recommended cultural practices were followed. The observations for vegetative parameters including plant height (cm), plant spread (cm), number of leaves, primary and secondary branches were recorded at 30, 60 and 90 days after transplanting (DAT). The experiment was laid out in Randomized Block Design (RBD) with 4 replications. Appropriate method was selected for statistical analysis of cost of cultivation.

### Cost of cultivation

Cost of cultivation = Total Fixed Cost + Total Variable Cost

### Fixed cost

Fixed Cost are remaining constant and do not varies with level of production. To calculate fixed cost of production, various cost components are taken into consideration.

### Variable cost

It includes cost of seed, fertilizer, water, harvesting, labour cost, transportation cost and miscellaneous cost.

### Profitability Concept

#### Gross Income

Gross Income = Physical Production x Price/qt

#### Net Income

Net Income = Gross Income - Total Cost

#### Benefit – Cost Ratio

Benefit – Cost Ratio = Net Income/ Total Cost

### Results

The economics of China aster under different treatments is usually a deciding factor for its adaptation by the farmers for commercial crop production. It is therefore, of wide interest to calculate the effects of various treatments on the basis of flower yield and to work out the most beneficial combination of these factor to be applied in raising the China aster.

Cost of cultivation and net profit per hectare was calculated on the basis of existing market rate of resources and product in the local market.

The total cost of cultivation was Rs.70310.17, in which the variable cost was Rs.54029.43, of which seed cost was Rs.15000, fertilizer cost (FYM, Urea, SSP, and Potash) was Rs.2500, 1330, 3675, and Rs.28.40 respectively. And about 8692 rupees and 287 rupees were spent in the preparation of land and seed treatment. As well as irrigation, plant protection, harvesting, transportation cost and other types of cost, total variable cost of Rs.3000, 861, 4000, 2000, and Rs.

The total fixed cost was Rs.10280.79, in which land revenue cost, rental value of land, management cost and depreciation cost were seen as Rs.24, Rs.12500, Rs.12500, Rs.2701.47, and Rs.280 respectively.

**Table 1:** Total cost of Cultivation of per Hectare of chine aster (Rs./Kg./Ha)

S. No.	Particulars	Total cost	
<b>COST A. Cost of variable resources</b>			
1.	Seed cost 3 Kg/ha@ Rs. 5000 Kg	15000	
<b>Fertilizer</b>			
2.	a. FYM 50000 Kg/ha@0.5 Kg	2,500	
	b. Urea 200 Kg/ha@6.65 Kg	1,330	
	c. SSP 400 Kg/ha@18.37 Kg	3,675	
	d. Potash 200 Kg/ha@7.10 Kg	28.40	
<b>Plant protection</b>			
3.	a. Insecticide/Pesticide	800	
	b. Fungicide	1,000	
<b>Labour</b>			
4.	a. Seed treatment	287	
	b. Land preparation		
	i	Ploughing	900
	ii	Harrowing	900
	iii	Cultivator	900
	iv	Levelling	900
	v	Preparation of field for nursery bed	500
	vi	Preparation of ridge and furrow	1,148
	vii	Transplanting	1,722
	viii	Staking	1,722
	c. Manure and fertilizers application	861	
	d. Inter-culture operations	1,148	
	e. Irrigation	3,000	
	f. Plant protection	861	
g. Harvesting	4,000		
h. Transportation	2,000		
i. Packaging/electricity charge	1,000		
5.	Tractor/Bullock	1,500	
	Total cost	50494.80	
6.	Miscellaneous (2% of total cost)	1,009.89	
7.	Interest on working capital (5%)	2,524.74	
	Total variable cost	54,029.43	
<b>COST B. Fixed cost</b>			
1.	Land revenue	24	
2.	Rental value of land	12,500	
3.	<b>Depreciation</b>		
	a. No junk value	100	
	b. With junk value	180	
4.	Management cost (5% of working capital)	2,701.47	
5.	Interest on fixed capital (5%)	775.27	
	Total fixed cost	16,280.79	
	Cost of cultivation	54,029.43+	
	Total Cost = Cost A +Cost B	16,280.79 = 70,310.17	

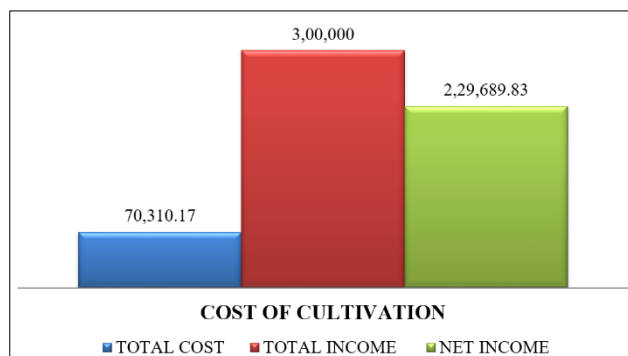
Under the profitability concept, the total profit was Rs 3,00,000, which was calculated by multiplying the sales rate with the total flower production, the total production in this

production came to about 12 tonnes per hectare. Whose per kg flower selling rate was 25 rupees per kg.

state of Yb172 and its magnetic moment. Nuclear Physics. 1965 Jan 1;61(1):65-86.

**Table 2:** Total Net Income of per Hectare production (Rs./tonne)

S. no	Cost of cultivation	54,029.43+ 16,280.79 = 70,310.17
	Average yield of flower	12 tonne/ha
	Sale rate (Rs./Kg)	25/Kg
	Total income/cost of production/ha	3,00,000
	Net return	2,29,689.83
	B:C ratio	1 : 3.26



**Fig 1:** Total cost, total income and net income (Rs)

Under the profitability concept, the total profit was Rs.3,00,000, which was calculated by multiplying the sales rate with the total flower production, the total production in this production came to about 12 tons per hectare. Whose per kg flower sales rate was Rs.25 per kg. The net income of the total production was Rs.229689.83 with a profit-cost ratio of 1:3.26.

### Conclusion

- Similar evaluation trial with new varieties along with the promising one from the current investigations should be conducted. This will help in the selection of suitable varieties for different purposes (like cut flower production, edging and bedding etc.) in this region.
- Study the vase life of the China aster with chemical preservatives can also be tried to extend the longevity and standardization the preservatives for China aster vase life.

### Reference

1. Bhargav V. Effect of different plant spacings and cultivars on Growth, flower and seed production of China aster (*Callistephus Chinensis* (L.) Nees.). Msc Thesis, Dr. Y S Parmar University of Horticulture and Forestry, Nauni, Solan; c2014.
2. Dhiman MR. Assessment of chrysanthemum germplasm for Commercial cultivation under Kullu valley condition. J. Ornamental Horticulture New Series. 2003;4(2):95-97.
3. Janakiran T. Production Technology of China aster Cultivation, Seminar report, IIHR, Bangalore; c1997. p. 115-120.
4. Subrahmanyam KV. Economics of production and marketing of chrysanthemum flowers in Karnataka. Indian J Hort. 1986a;43(3&4):281-223.
5. Günther C, Blumberg H, Engels W, Strube G, Voss J, Lieder RM, *et al.* Observation of dipole-octupole mixture in the gamma-decay of the 1174 keV isomeric