



# Assessment of Chrysanthemum (*Dendranthema grandiflorum*) Varieties for Yield and Productivity in Salem District

P S Kavitha<sup>1</sup>, A Sudha<sup>2</sup> and N Sriram<sup>3</sup>

Krishi Vigyan Kendra, Sandhiyur, Salem-636001 (Tamil Nadu)

## ABSTRACT

Chrysanthemum (*Dendranthema grandiflorum*) is a member of the family *Asteraceae*, mainly grown for cut flower and loose flower for garland making, general decoration, hair adornments and religious function. The major varieties grown by the farmers of Salem district in Tamil Nadu are local, chandini, karnool, uppili etc. Technical problems faced by the farmers were low yield, poor quality flowers, high cost of planting materials and high cost of cultivation. On farm trial was conducted with CO 1 variety released by Tamil Nadu Agricultural University, Coimbatore and the locally adopted variety. Five chrysanthemum growing farmers were selected at different locations of pannapatti village with an area of 2ha each for the trial. RBD was laid out with three varieties as treatments and seven replications. CO1 performed well and recorded highest yield (11.2 t/ha) than the local variety (5.8 t/ha). The major attribute for increase in yield is big flower size (4.0-4.5 cm dia) in CO 1 than the local varieties (2.8-3.4 cm). Besides, CO1 gave ratoon crop that led to dramatic reduction in cost of cultivation. CO1 variety with big flower size and increase in yield than the local varieties fetched higher price in market. There is a need to standardize the optimum dose of nutrients particularly the integrated nutrient management for improving the soil structure, physico-chemical properties and flower yield for CO 1 variety.

**KeyWords :** Front line demonstration, Intervention, On farm trial, Ratoon crop.

## INTRODUCTION

Chrysanthemum (*Dendranthema grandiflora* Tzeuleu) in the family *Asteraceae* occupies a prominent place in ornamental horticulture is one of the commercially exploited flower crops. The international market for cut and potted chrysanthemums is increasing, and chrysanthemums in many European and Asian countries are commercially very important for the floral industry. In India, Tamil Nadu is the second largest producer of loose flowers and occupies 9 per cent of total flower area is occupied by Chrysanthemum. The flower crop sector provides good employment opportunities to the farmers especially to small and marginal farmers and female labour (Kaviarasan *et al*, 2015). Further, the export of flower also generates good export earnings to the country. Though the Chrysanthemum is one of the important commercial

flower crops in major state like Karnataka, Tamil Nadu and Andhra its yield and quality levels are low and hence there is a need to standardize the varieties suitable for growing in particular region along with standardization of optimum dose of nutrients particularly the integrated nutrient management for improving the soil structure, physico-chemical properties and flower yield.

Chrysanthemum (Samanthi) is being cultivated in an area of 850 ha in Salem district covering omalur and kadayampatti blocks and some scattered patches all over the district. Flowers are sold as loose flowers for making garlands and ritual functions. The farmers are regularly growing more varieties and mostly the planting materials are purchased from farmers of Hosur, kaddapa, gundukal and Bangalore. The major varieties grown by the farmers are local, chandini, karnool, uppili etc. They market

the bulk of produce regularly in Bangalore market and a meager one in local market. Major problems faced by the farmers were low yield, poor quality flowers, high cost of planting materials and cost of cultivation. As the result farmers were in dilemma to continue the crop that they cultivated for the last two decades.

Scientist team from KVK visited the Pannapatti village cluster where more than 90 per cent of the area are under Chrysanthemum cultivation and conducted base line survey about village and the farmers behaviour. PRA was conducted with help of Multi-disciplinary team and group of local farmers and found the local felt and unfelt needs in chrysanthemum cultivation. For assessing the suitable high yielding varieties under farmer's cultivation, the TNAU released variety CO1 was included along with local variety and chandini.

## MATERIALS AND METHODS

A trial was conducted during 2015-16 for assessing the suitable high yielding varieties under farmer's cultivation. Experiment was conducted at 5 fields on 10 ha area comprising 2 ha each with three varieties namely, Local (TO 1), hybrid CO 1 (TO 2) and Chandini (TO 3) as three treatments, at Pannapatti village, Omalur block of Salem District. Statistical design adopted was RBD with seven replications. Tabular analysis was used to calculate the floral characteristics and profitability was computed using cost and return concepts. Terminal cuttings were used as planting materials for all the three varieties. Planting was done during June - July at 30 x 30 cm spacing on one side of ridges (1,11,000 plants/ha). Irrigation was done twice a week in the first month and subsequently at weekly intervals. Recommended dose of 25t FYM and 125:120:25 kg NPK/ha was applied. Basal application of half of N + entire P and K; top dressing of half of N applied 30 days after planting.

Pinching was done 4 weeks after planting to induce lateral branches. The side suckers were removed (desuckering) periodically. Foliar spray

of  $ZnSO_4$  0.25 per cent +  $MgSO_4$  0.5 per cent was given at 30<sup>th</sup> and 45<sup>th</sup> day after planting. GA3 @ 50 ppm was sprayed on 30<sup>th</sup>, 45<sup>th</sup> and 60<sup>th</sup> day after planting. Duration of the crop was 6 - 8 m for plant crop and 4 m for ratoon crops. Harvesting of the flowers started from 3<sup>rd</sup> m onwards at 4 d intervals. Harvesting was done at 3/4 to full open stage for nearby markets and 1/2 open stage for distant markets. Farmers were given training on cultivation practices, crop management, plant protection measures, harvest, marketing studies and trained to observe the floral and yield characteristics of the assessed varieties.

## Technologies involved

- Introduction of TNAU released CO 1 Chrysanthemum variety
- Propagation by rooted suckers in farmers field
- Soil testing and STCR based recommendation
- Use of bio-control as soil application, foliar spraying and root dipping
- Special practices like pinching of terminal shoots (once in 4 weeks)
- Flower regulation by use of growth regulators (foliar spraying of 50 ppm Gibberellic acid on 30,45 and 60 days after planting)
- Training on harvesting, grading and marketing of the produce
- Formation of chrysanthemum grower association

Periodical observation was made in all the fields and data were recorded on growth of the plant, first flowering, crop duration, yield per plant, flower size, flower weight, flower diameter, flower colour, yield/ha, net return, benefit cost ratio etc.

## RESULTS AND DISCUSSION

Among the treatments it was evident (Table 1) that TO 3 recorded the highest flower yield per plant (51.57) than TO 2 - TNAU released variety CO1 (46.14) and TO 1- local variety (28.43 flowers)

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**Table 1. Floral characteristics of Chrysanthemum varieties.**

Sr. No.	Treatment	Size of the flower	Flower diameter (cm)	Wt of the flower (g)	No. of flowers /pt	Colour of the flower	Market preference	Blooming period
TO 1	Local	Small	3.09	2.01	28.43	Light yellow	Loose flowers and garland	Oct
TO 2	CO 1	Medium sized	4.24	2.50	46.14	Bright yellow	Garland and decorative purpose	Sep
TO 3	Chandini	Very small	2.23	1.73	51.57	Medium yellow	Loose flowers	Oct
CD (0.05 %)			0.19	0.46	2.32			
SEd			0.09	0.21	1.06			
CV (%)			5.29	19.92	4.76			

**Table 2. Yield characteristics of Chrysanthemum varieties.**

Treatment	Ratooning habit and yield of ratoon crop	Production (t/ ha)	Benefit Cost ratio	Net return (Rs.)
TO 1	-	5.86	1.16	79,000/-
TO 2	One ratoon (Feb-April) 4.3 t/ha	11.13	2.10	1,85,000/-
TO 3	-	9.19	1.46	1,35,000/-
CD(0.05 %)	-	0.10	-	-
SEd	-	0.04	-	-
CV (%)	-	1.03	-	-

where as the size of flower was medium in TO 2 followed by TO 1 and TO 3 (Jamal et al, 2015). Hence, CO 1 recorded highest yield (11.13 t/ha) than the local variety (5.86 t/ha) as inferred from Table 2. The major attribute for increase in yield is big flower size ( 4.24 cm dia) in CO 1 than the local varieties (3.09 cm dia). In addition the weight of the flower was found to be highest 2.5 g per flower in CO 1 followed by Local variety (2.01 g) and Chandini (1.73 g). Besides, CO1 was found to give ratoon crop that led to dramatic reduction in cost of cultivation. Moreover CO1 being early flowering (25 -30 d) and bloomed in the month of September compared to the existing varieties that bloomed

during the month of October led a better market price in lean season too. This was in line with the findings that flowering period was ranged from 50.59 to 132.99 d in chrysanthemum (Barigheid and Patil, 1996), which resulted late and early flowering habits among cultivars flowering times in chrysanthemum were affected by varietal characters, habitat and species type (Kim *et al*, 2014). TO 1 and TO 3 flowers were meant only for loose flowers and garland making but TO 2 *i.e.*, CO 1 has thick stalk and is used both loose flower, garland and also for bouquet and decorative purposes. By seeing all the merits it was recommended to the farmers to cultivate this crop along with other existing

varieties to have the marketable produce throughout the years. Hence during 2016-17 through KVK this variety CO 1 was popularized through FLD (Front line Demonstration) among the people of Pannapatty.



Early flowering in CO 1 compared to Chandini



Difference in flower size

CO1 variety with big flower size (Fig.1.) and increase in yield than the local varieties fetched higher price in market (Joshi *et al*,2009). Due to its early flowering habit it fetched more returns during the peak season when the other varieties are in vegetative stage (Fig.2). The average yield was 104 q/ha as against 76 q/ha in local varieties with 36.84 % yield increase. The farmer obtained a net return of Rs. 302500/ha with BCR of 2.1 in a period of eight months (Verma *et al*, 2011). The rate /Kg varies from Rs.10 /Kg to Rs 140/Kg. Further, it fetched an addition yield (4.3t/ha) during ratoon crop and an income of Rs. 80000/ha (Table 2). Before the intervention of KVK, the farmers used to grow only the local varieties and their economic gains were

less. They had low level of knowledge about the scientific method of cultivation and IPM measures. But after the intervention, they were well trained in problem diagnosis, ecofriendly management practices and group marketing activities.

In marketing of chrysanthemum flowers, the farmers were mainly routed through the commission agents in the Bangalore market (Kaviarasan *et al*, 2015). The exorbitant rate of commission charge was the main constraint for the farmers which was stream lined by forming grower association and now the farmers were selling their produce directly in the flower market.

## CONCLUSION

The following were the conclusions derived from the above study of which the chrysanthemum growers of pannapatti village of Salem district were very much satisfied and fetched more income by improved yield. TNAU hybrid CO1 recorded highest yield (11.13t/ha) than the local variety and chandini and hence suitable for Salem district. The flower size was bigger in CO 1 than the other two varieties. Early flowering was observed in CO 1, which fetched more market price. In addition, ratoon crop fetched an extra yield for 2 months. Varietal replacement was found to be significant (28.5%). Farmers started growing both chandini and CO 1 to balance the market price fluctuation. Few more varieties have to be assessed for the suitability at Salem district in future.

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