RESEARCH PAPER International Journal of Agricultural Sciences, Vol. 7 Issue 1 (January, 2011) : 109-112

Effect of weed control methods on quality of China aster flower [*Callsitephus chinensis* (L.) Nees]

C. VINAYKUMAR* AND J.V. NARAYANA GOWDA
Division of Horticulture, University of Agricultural Sciences, G.K.V.K., BENGALURU (KARNATAKA) INDIA

ABSTRACT

China aster is one of the important commercial flower crop in India, but the quality of flower is not meeting the required standard. Weeds are one of the main limiting factors for the poor quality; so now-a-days herbicides are integral part of intensive agriculture. The present investigation was taken up to know the effect of different weed management practices on quality of China aster flower. Hand weeding thrice took less number of days for 50% of flowering besides increasing the stalk length, diameter of flower and fresh weight of flower, which was at par with oxyfluorfen 0.1kg a.i/ha followed by earthing up at 35 DAT. Unweeded control showed poor performance in all the flower quality parameters mentioned above. Besides controlling weeds effectively and increasing the yields, the herbicides also increased the quality of China aster flower.

Vinaykumar, C. and Gowda, J.V. Narayana (2011). Effect of weed control methods on quality of China aster flower [*Callsitephus chinensis* (L.) Nees]. *Internat. J. agric. Sci.*, **7**(1): 109-112.

Key words : China aster, Vase life, Herbicides, Flower, Diameter, Stalk lengh

INTRODUCTION

China aster [*Callistephus chinensis* (L) Ness] a member of the family *Asteraceae*, is one of the important commercial flower crops of our country. It is also an important commercial flower crop of Siberia, Russia, Japan, North America, Switzerland and Europe. It is native to China and has spread to Europe and other tropical countries during 1731 AD.

Aster can be grown successfully in open conditions. Its flowers are used for various purposes. Cut asters last long and are used in vases and flower decoration. It is also used in the preparation of bouquets, garlands, etc. It is very popular as a bedding plant and they are also used to grow as potted plants. Dwarf types are suitable for edges and used as herbaceous border plant in parks and gardens.

The science of weed control has advanced considerably during the past two decades. A number of herbicides have become available in the market for control of weeds in flower crops. However, detailed information on this choice of herbicides, their appropriate dosage and time of application is not fully available to the farmers usage. Considering the economic importance of China aster, the present study was taken up with the following objective.

MATERIALS AND METHODS

The studies were conducted in floriculture division at Division of Horticulture, University of Agricultural Science, GKVK, Bangalore, during 2001-2002 using China aster var. Kamin. The soil was red sandy loam in nature. The experimental design was RCBD with three replications. The raised nursery beds were sown in lines and covered with a layer of soil and watered regularly with rose can. Four weeks old healthy and uniform seedlings were transplanted in well-prepared plots of 2.1x2.1 m^2, at a distance of 30 x 30 cm recommendations and three cultural practices along with unweeded control were compained.

The details of the treatments were as follows: T_1: Unweeded control (Weedy Check), T_2: Hand Weeding at 30, 60, 90, DAT, T_3: Trifluralin (48 E.C) 1.25 kg a.i. ha^{-1}pre-emergent on 3 DAT, T_4: Trifluralin (48 E.C) 1.00kg a.i ha^{-1} pre-emergent on 3 DAT, T_5: Trifluralin (48 E.C) 0.75 kg a.i ha^{-1} 3 DAT followed by earthing up at 35 DAT, T_6: Pendimethalin (30 E.C) 1.25kg a.i. ha^{-1} pre-emergent on 3 DAT, T_7: Pendimethalin (30 E.C) 1.00kg a.i. ha^{-1} pre-emergent on 3 DAT, T_8: Pendimethalin (30 E.C) 0.75kg a.i. ha^{-1}3 DAT followed by earthing up at 35 DAT, T_9: Metolachlor (50 E.C) 1.50 kg a.i. ha^{-1}pre-emergent on 3 DAT, T_{10}: Metolachlor (50 E.C) 1.25 kg a.i. ha^{-1}pre-emergent on 3 DAT, T_{11}: Metolachlor (50 E.C) 1.00 kg a.i. ha^{-1}3 DAT followed by earthing up at 35 DAT· T_{12}: Oxyfluorfen (23.5 E.C) 0.15 kg a.i. ha^{-1} pre-emergent on 3 DAT, T_{13}: Oxyfluorfen (23.5 E.C) 0.12 kg a.i. ha^{-1} pre-emergent on 3 DAT and T_{14}: Oxyfluorfen (23.5 E.C) 0.10 kg a.i ha^{-1} pre-emergent on 3 DAT

* Author for correspondence.

RESULTS AND DISCUSSION

The predominant weeds present in experimental field were *Cyperus rotundus*, *Cynodon dactylon, Eluesine indica, Digitaria mariginata, Amaranthus viridis, Euphorbia geniculata, Ageratum conyzoides, Chenopodium album etc.*

Hands weeding recorded lower weeds (13.83) but the maximum number of total weeds were noticed in unweeded control. Among herbicides oxyfluorfen 0.1kg a.i./ha followed by earthing up at 35 DAT recorded the minimum number of total weeds (18.07) and it was at par with metolachlor 1.0 kg a.i/ha followed by earthing up at 35 DAT (23.17).

Hand weeding recorded the lowest total weed dry matter at 90 DAT (7.16), followed by oxyfluorfen 0.1 kg a.i/ha^{-1} followed by earthing up at 35 DAT (9.96) and metolachlor. 1.0kg a.i/ha followed by earthing up at 35 DAT (12.48). Frequent removal of weeds throughout the crop life cycle both in intra as well as inter row spacing, which resulted in lower weed density and lower weed biomass in hand weeding.

Effect of weed management treatments on flower growth and quality of flower is presented in Table 1. Marked difference on days taken for 50 per cent flowering in China aster were obtained with different herbicide treatments. Less number of days was taken for the first floweirng with hand weeding (T_2), oxyfluorfen 0.10 kg a.i ha^{-1} followed by earthing up at 35 DAT (T_{14}) and metolachlor 1.0 kg a.i ha^{-1} followed by earthing up at 35 DAT (T_{11}) as a result of lower weed competition. This was due to better growth of crop as a result of good weed control. Whereas, more number of days taken for the first flowering with unweeded control (T_1) owing to weed competition. Similarly, delayed flowering was observed in Gladiouls owing to weed competition, as reported by Koutepar (1982).

Hand weeding (T_2) recorded significantly higher

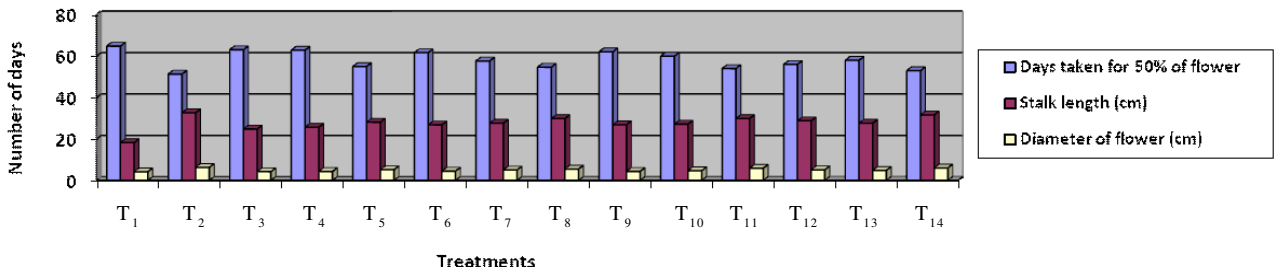
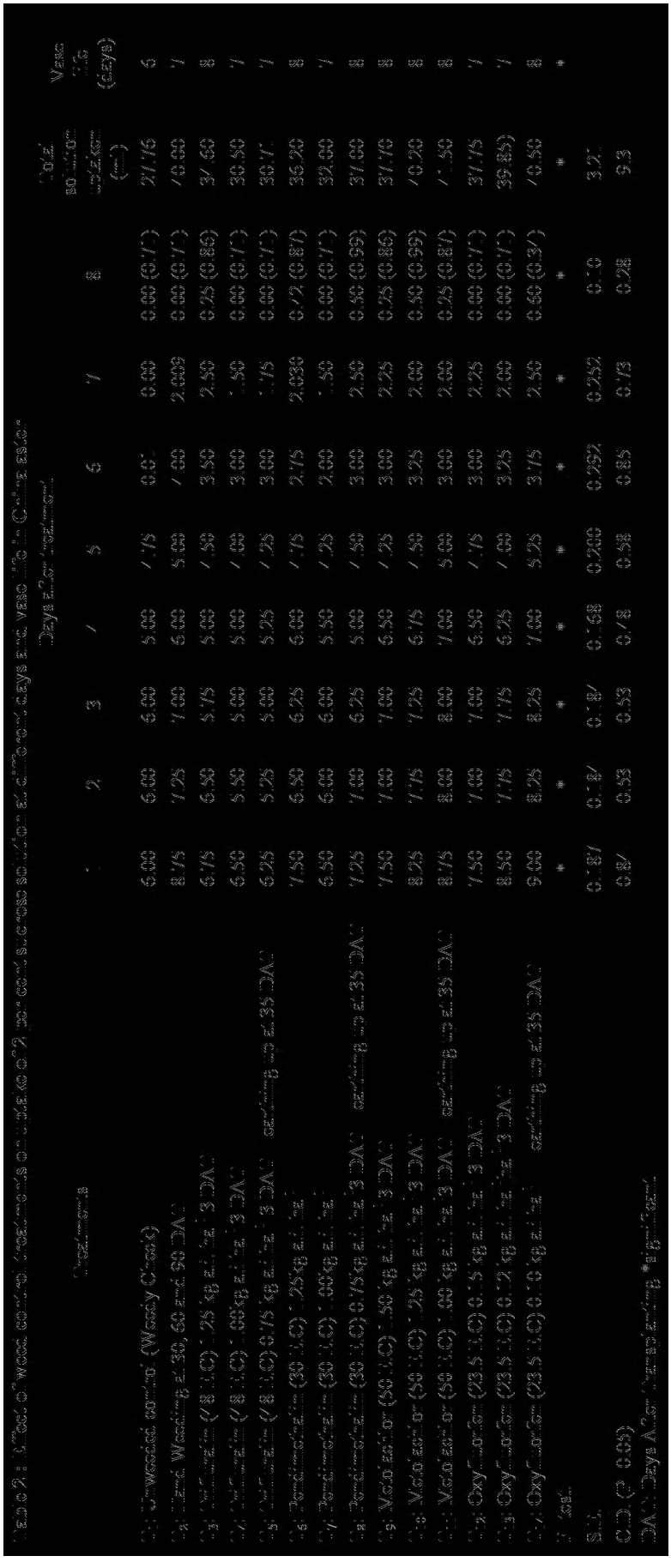


Fig. 1 : Effect of herbicides on days taken for 50% of flower, stalk length (cm) and diameter of flower (cm) in China aster

Table 1 : Effect of herbicides on days taken for 50% of flower, stalk length (cm) and diameter of follower (cm) in China aster

Treatments	Days taken for 50% of flower	Stalk length (cm)	Diameter of flower (cm)
T_1: Unweeded control (Weedy Check)	64.83	18.22	4.11
T_2: Hand Weeding at 30, 60 & 90 DAT	51.34	32.63	6.25
T_3: Trifluralin (48 E.C) 1.25 kg a.i. ha^{-1} 3 DAT	63.11	24.78	4.19
T_4: Trifluralin (48 E.C) 1.00kg a.i ha^{-1} 3 DAT	62.89	25.66	4.28
T_5: Trifluralin (48 E.C) 0.75 kg a.i ha^{-1} 3 DAT + earthing up at 35 DAT	55.00	28.10	5.12
T_6: Pendimethalin (30 E.C) 1.25kg a.i. ha^{-1}	61.67	26.78	4.44
T_7: Pendimethalin (30 E.C) 1.00kg a.i. ha^{-1}	57.67	27.66	4.99
T_8: Pendimethalin (30 E.C) 0.75kg a.i. ha^{-1}3 DAT + earthing up at 35 DAT	54.66	29.86	5.46
T_9: Metolachlor (50 E.C) 1.50 kg a.i. ha^{-1} 3 DAT	62.09	26.85	4.31
T_{10}: Metolachlor (50 E.C) 1.25 kg a.i. ha^{-1} 3 DAT	60.00	27.16	4.65
T_{11}: Metolachlor (50 E.C) 1.00 kg a.i. ha^{-1}3 DAT + earthing up at 35 DAT	54.00	29.87	5.86
T_{12}: Oxyfluorfen (23.5 E.C) 0.15 kg a.i. ha^{-1} 3 DAT	56.00	28.77	5.08
T_{13}: Oxyfluorfen (23.5 E.C) 0.12 kg a.i. ha^{-1}ha^{-1} 3 DAT	58.00	27.64	4.79
T_{14}: Oxyfluorfen (23.5 E.C) 0.10 kg a.i ha^{-1} ++ earthing up at 35 DAT	53.00	31.64	5.98
F- test.	*	*	*
S.E. ±	0.86	1.57	0.39
C.D. (P=0.05)	2.51	4.55	1.12

DAT- Days After Transplanting * Significant



flower stalk length and was highly at par with oxyfluorfen 0.10kg a.i.ha^{-1}followed by earthing up at 35 DAT (T_{14}) and metolachlor 1.0 kg a.i ha^{-1} followed by earthing up at 35 DAT (T_{11}), the season long weed free condition in hand weeding and higher weed control efficiency in oxyfluorfen followed by earthing up attributed to better crop growth, as a consequence resulted in higher flower stalk length.

The flower stalk length and flower diameter are important quality attributes determining suitability as a cut flower. Quite often the value of the cut flowers generally varies with the flower stalk length and bigger size flowers fetch higher prices. This is obviously due to the usefulness of such flowers in flower arrangements, for making bouquets and garlands and even for their preference in beds, borders and in pot culture apart from its export value.

The weed control treatments caused significant variation in flower diameter with weed control treatments. The maximum diameter of flower was obtained with hand weeding (T_2) and was at par with oxyfluorfen 0.10kg a.i. ha^{-1}followed by earthing up at n35 DAT (T_{14}) and the least dimater was owing to the application of trifluralin 1.25 kg a.i. ha^{-1} (T_3). However, the unweeded control recorded the least flower diameters (T_1) as result of weed competition. However, Baranowski (1974) reported the effectiveness of herbicides in increasing the flower diameter in China aster owing to good weed control

Vase life :

Herbicides has no remarkable effect on vase life of China aster but still the treatment oxyfluorfen 0.1 kg a.i. ha^{-1} followed by earthing up at 35 DAT recorded the highest uptake of vase solution compare to all other treatments (Table 2).

The cumulative uptake of solution was maximum with oxyfluorfen 0.1 kg a.i. ha^{-1} followed by earthing up at 35 DAT (40.5 ml), metolachlor 1.25 kg a.i. ha^{-1} 3 DAT and hand weeding (40.00 ml). Whereas, minimum solution uptake was noticed in unweeded control (27.76ml).

The results indicate that the hand weeding, oxyfluorfen 0.1 kg/ha followed by earthing up at 35 DAT and metolachlor 1.0 kg/ha followed by

earthing up at 35 DAT yielded the good quality flower and were at par with each other and superior over other treatments. Though the hand weeding was superior with respect to weed control, number of days taken for flowering and quality of flower. The oxyfluorfen 0.1 kg/ha followed by earthing up at 35 DAT resulted in higher profit per rupee invested. It can be conculded that chemical weed control in China aster can be profitably followed to overcome the tedious problem of hand weeding and by judicious use, yields can be increased.

REFERENCES

Koutepar, N.G. (1982). Effect of weeds and herbicides on qualitative and quantitative characteristics of Gladiolus. *Zizaniologia*, **1** (1): 39-42.

Received : August, 2010; Accepted : September, 2010