VI. SUMMARY

The present investigation was carried out to study the “Effect of NPK and biofertilizers on growth, yield and quality of china aster (Callistephus chinensis (L.) Nees) cv. Poormima for cut flower purpose” during the year 2013-14, in the experimental field, Floriculture section, Regional Horticultural Research and Extension Centre, College of Horticulture, University of Horticultural Sciences campus, Gandhi Krishi Vignana Kendra (post), Bengaluru. The salient findings of this investigation are summarized in this chapter.

In general, the growth, yield and quality of china aster were better when NPK were supplemented along with Azospirillum and PSB when compared to application of Arka microbial consortia and NPK alone.

- Among the growth parameters, significantly maximum plant height (54.67 cm) and plant spread in north-south direction (42.60 cm) and in east-west direction (41.00 cm) were recorded with the application of 100% NPK + Azospirillum + PSB at 90 DAT.

- Number of branches (11.10) and (18.17) at 60 and 90 DAT were maximum in the treatment receiving 75% N and P + 100% K + Azospirillum + PSB at 60 and 90 days after planting respectively.

- Leaf area (17.67 cm²) was maximum in the treatment receiving 50% N and P + 100% K + Azospirillum + PSB at 90 DAT.

- The maximum fresh weight of plant (137.58 g) was achieved by the application of 100% NPK + Azospirillum + PSB. The maximum dry weight of plant (65.80 g) was achieved by the application of 100% NPK + Azospirillum + PSB.

- The earliness in flowering was significantly influenced by different treatments. The early first flowering (64.00 DAT) and 50 per cent flowering (67.00 DAT) was achieved by the application of 50% N and P + 100% K + Azospirillum + PSB.

- Stalk length (27.87 cm) and flower diameter (6.09 cm) were significantly higher in treatment supplied with 50% N and P + 100% K + Azospirillum + PSB.

- The maximum number of cut flowers per plant (7.33) and number of cut flowers per hectare (8.13 lakhs/ha) were achieved by the application of 75% N and P + 100% K + Azospirillum + PSB.

- The maximum weight of cut stem (148.00 g) was achieved by the application of 100% NPK + Azospirillum + PSB.

- Plant analysis indicated that the supply of 100% NPK + Azospirillum + PSB showed maximum NPK content in different plant parts.

- The soil test indicated significant influence of treatments on available NPK. The maximum available nitrogen (248.00 kg/ha), phosphorous (50.07 kg/ha) and potassium (138.80 kg/ha) were recorded by the application of 100% NPK + Azospirillum + PSB.

- Biofertilizer application improved the total microbial population in the rhizosphere by several times. 100% NPK + Azospirillum + PSB treatment resulted in the highest colonization of
Azospirillum \((13.40 \times 10^6)\) and PSB \((12.88 \times 10^6)\) in the rhizosphere of china aster when compared to all other treatments.

- The maximum vase life of cut flowers \((8.00 \text{ days})\) in tap water, water uptake \((36.00 \text{ g})\), transpiration loss \((29.30 \text{ g})\) and fresh weight \((83.12 \text{ g})\) during the 8th day of vase life of cut flowers were achieved by applying 75% N and P + 100% K + Azospirillum + PSB.

- Results have clearly showed that the application of recommended nitrogen, phosphorous and potassium can be saved with dual inoculation of Azospirillum and PSB besides obtaining higher china aster cut flower yield.

- The application of 75% N and P + 100% K + Azospirillum + PSB has resulted in maximum net returns with a benefit cost ratio of 1:5.83 per hectare.

Thus, the field experiment has indicated that the application of biofertilizer has brought about positive effects on vegetative growth, cut flower yield, quality and vase life of china aster and rhizosphere microbial population. Its application along with 50 per cent NPK chemical fertilizers was as effective as 100 per cent NPK fertilizer application in all the parameters, indicating a net saving of chemical fertilizers by 50 per cent.

Practical utility of the investigation

1. Application of 75% N and P + 100% K + Azospirillum + PSB found to be economically feasible in reducing the fertilizer quantity with higher net returns and benefit cost ratio. Hence, the findings of this investigation can be of immense help to the china aster growers.

2. Addition of 50% N and P + 100% K + Azospirillum + PSB have improved the quality parameters viz., stalk length and diameter of flower in china aster. This indicates their beneficial influence on improving china aster quality flowers.

Future line of work

Based on the results obtained from the present investigation, the following future line of work is suggested.

1. Present study was conducted with different NPK levels and seedling treatment with biofertilizers. Further, study can be tried with combination treatment of seed, soil and seedling with different NPK levels.

2. The biofertilizers Arka microbial consortia can be tried with different levels of NPK and different strains of biofertilizers.