

SPACING OF FIELD GROWN PERENNIAL CROPS - AN INTERIM REPORT

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Abstract

Achillea 'Coronation Gold', *Achillea millefolium* 'Rose Beauty', and *Physostegia virginiana* were all planted on 30, 60, 90 or 120 cm centers. Data were collected for 2 or 3 years depending on species. In all cases the number of flowering stems per plant increased but the number of stems per square meter decreased as spacing increased. Stem lengths of *Achillea* 'Coronation Gold', *Achillea millefolium* 'Rose Beauty' and *Physostegia virginiana* were significantly affected by spacing but flower size and stem diameter remained unchanged regardless of planting distance.

1. Introduction

Field grown cut flower crops have increased in popularity in many European countries in recent years. Part of the increase in production is due to the exportation of cut flowers to countries such as the United States of America. American markets for many minor crops such as *Liatris* and *Eryngium* have been opened by foreign imports particularly from the Netherlands. A very small field grown cut flower industry exists in the United States and consists mainly of growers of *Gypsophila*, *Limonium* and *Gladiolus* species.

Research at the University of Georgia New Crop program has been concerned with identification of new species useful for North American markets and obtaining cultural information necessary to grow the crops economically and efficiently. Many of the new cut flowers are herbaceous perennial species which increase in size with time. Therefore the initial space between plants will decrease over time and spacing at time of planting may have a marked influence on yield and quality of cut stems in subsequent year.

The objective of this research was to determine the influence of initial plant spacing on subsequent yield and quality of cut flower stems.

2. Plant Material

Achillea 'Coronation Gold' (*A. clypeolata* x *A. filipendulina*), *Liatris pycnostachya* and *Salvia leucantha* were purchased as potted plants in 10 cm pots and planted in Spring, 1984. *Achillea millefolium* 'Rose Beauty' and *Physostegia virginiana* were propagated from seed in the University of Georgia greenhouses and planted in the spring of 1985.

3. Methods

Plants were placed either 30, 60, 90 or 120 cm apart depending on species. *A.* 'Coronation Gold' and *L. pycnostachya* were placed at all spacings; *A. millefolium* 'Rose Beauty' and *P. virginiana* were placed 30, 60 or 90 cm apart and *S. leucantha* was placed on 60, 90 or 120 cm centers.

Plants were fertilized each spring with a side dressing of 10N - 6.2P - 8.2K but no fertilization was done prior to that time. Weeds were controlled by hand, by physical barrier (Weed-Mat, Dupont Co., Wilmington, DE) and by herbicides (Poast, BASF-Wyandotte, Parsippany, NJ)

Plants were irrigated originally with overhead sprinklers but drip irrigation was installed in spring of 1986. *A.* 'Coronation Gold' was harvested 3 times during the season and all others were harvested twice.

Data were collected for yield, stem diameter, stem length and inflorescence diameter for each harvest period and for each spacing. Trend analysis and analysis of variance were applied to the data.

4. Results and Discussion

A. 'Coronation Gold': There were no significant differences in the first year between spacings but increase in spacing distance resulted in increased yield per plant and decreased yield per square meter in subsequent years (Fig. 1). There were no differences in stem length between spacing in 1984, but in 1985 medium size stems (25-50 cm) increased linearly with spacing and long stems (> 50 cm) decreased in a linear trend in 1985 (Table 1). In 1986, a quadratic trend occurred for medium and long stem sizes (Table 1). There were no significant differences in stem diameter or flower inflorescence due to spacing (data not shown). There was, however, significant reduction in stem length and inflorescence diameter due to harvest time although stem diameter was not affected (Fig. 2). The data in figure 2 indicate that the second flush of flowers provided the longest stem length and that the first flush, although shorter, provided the strongest stems and largest inflorescences.