

Bee Visitation and Nectar Production of Anise Hyssop

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In an earlier report flowering duration was recorded for several herbs during the growing season. Anise hyssop (*Agastache foeniculum*) was identified as one of the most promising species for further investigation. It was very attractive to bees and had a long flowering duration (June through September). In 1995 and 1996 nine row width-density spacing combinations were established to provide information on cultural management. These were three row widths (25, 50 and 75 cm) and three intra-row spacings (12.5, 25 and 37.5 cm). Seedlings were established in the greenhouse in April and transplanted into the field at the Agronomy research farm in Deerfield, MA., in early May 1995.

Flower number per plant ranged from 15,000 at the closest spacing to more than 90,000 at the widest spacing in 1995 and somewhat less from 10,000 to 40,000 in 1996. This wide variation was mainly a result of more inflorescences being produced per plant at the low plant densities. This high degree of plant plasticity, allowing the plants to adjust to changing density, resulted in a mostly similar number of flowers being produced per unit area in 1995. There were approximately 400,000 flowers per square meter for honey bee to forage in 1995. In 1996, the flower number per square meter was lower with the narrowest row spacing having the most flowers, 270,000, compared to 140,000 for the widest spacing and lowest density.

Plants were heavily visited by bees during the flowering period. The average number of visiting bees in the 50 cm row spacing plots in 1995 was 38 bees/m², slightly greater than the number in 25 cm row spacing plots (37 bees/m²), but larger than the number in 75 cm row spacing plots (34 bees/m²). Bee visits increased as anise hyssop entered the peak flowering period, then dropped off during the late flowering season. Peak visiting was in mid-August with about 45 bees/m² during the middle of the day. The different row spacings resulted in different patterns of bee visitation (Fig. 1). The peak visiting was delayed until late August for the 75 cm row spacing, whereas the closer rows had peak visiting in mid-August. Bee visits were consistent with the the flowering patterns of these treatments.

The sugar content of anise hyssop flowers increased as the stages of flowering advanced (Fig. 2). Sugar content was very low in bud stages, but increased significantly from bud stage to the open flower stage, then significantly decreased in senescing flowers. Using cheese cloth to exclude honey bees and other insects open flowers accumulated about 139 ug/flower of sugar. Therefore, with a flowering period of 2 to 3 days for each flower and a honey moisture content of 18%, the estimated honey yield was 1,741 to 2,612 kg/ha (1,553 to 2,330 lb/ac) in the 50 cm x 37.5 cm plant spacing and 1,976 to 2,963 kg/ha (1,763 to 2,643 lb/ac) for the 50 cm x 25 cm plant spacing.

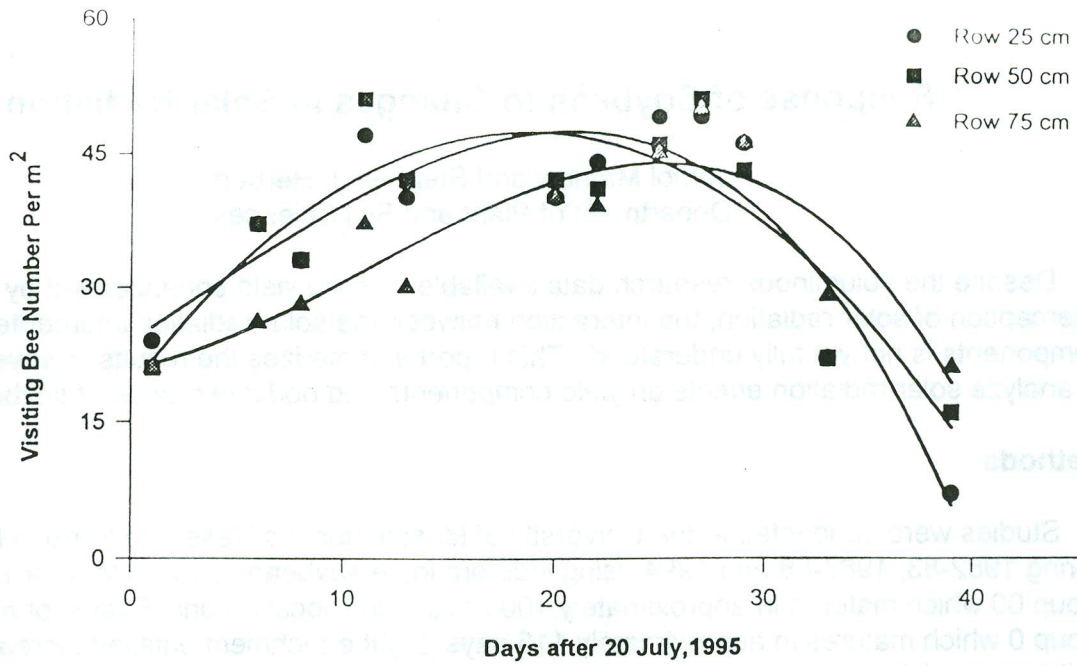


Figure 1. Visiting patterns of bees in three row spacings of anise hyssop during the peak flowering period.

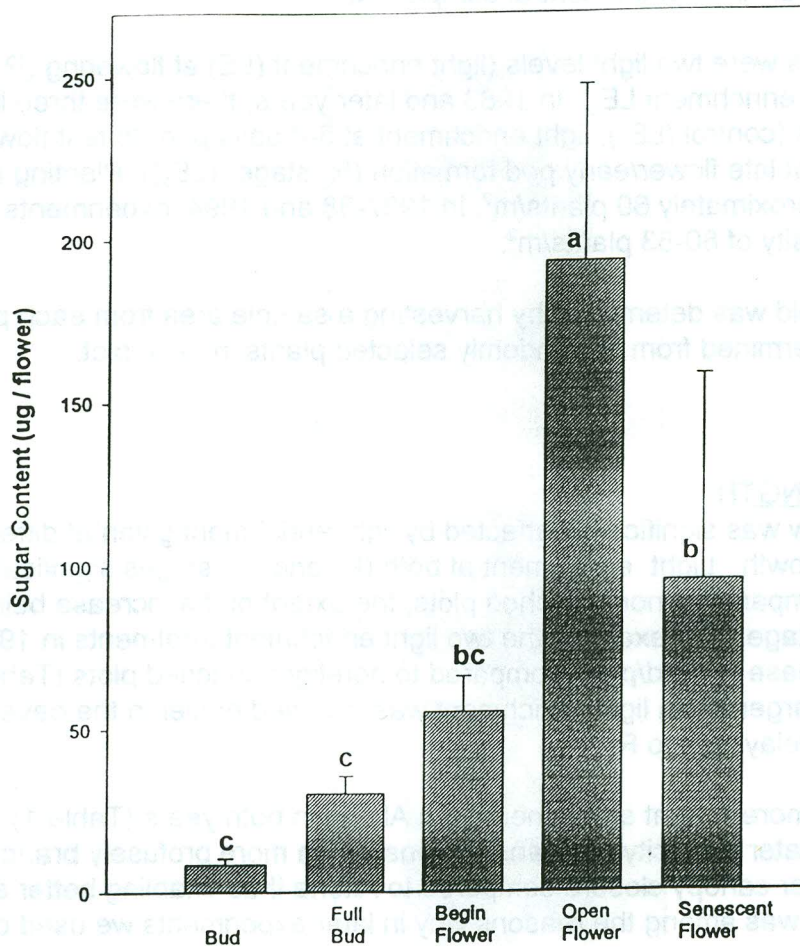


Figure 2. Anise hyssop sugar content of nectar in flowers.