Studies of Nectar Production and Floral Attractiveness to Honey Bees of Varieties of Birdsfoot Trefoil

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Eight varieties of birdsfoot trefoil consistently produced different volumes of nectar, both per floret and per umbel, under growth room and field conditions. Leo and Carroll were among the highest and Maitland the lowest. A two-fold range in nectar volume per floret was found in growth room studies, with a similar range in field measurements. Aroma production varied significantly among the eight varieties. High nectar-yielding varieties generally produced a medium to strong aroma, while low nectar-yielding varieties produced little or no aroma. Varieties which produced many umbels per plant produced more nectar per umbel, as well as a stronger aroma. Honey bee visitation on each variety was positively correlated with both sugar weight and numbers of flowers produced per plant of that variety.

Screening of plants of two high and two low nectar-yielding varieties indicated variation in nectar production within varieties. The volume of nectar produced per floret showed a low though significant correlation with standard petal area, used as an index of floret size. Nectar yield was significantly correlated with peduncle cross-sectional area. However, using peduncle cross sectional area was not equally effective in predicting nectar yield in all varieties and breeding populations. These results suggest a differential nectary capacity of different genotypes for nectar production. Screening for high nectar yield may be facilitated by observations of floret number, aroma production, peduncle and plant size and vigour, prior to sampling of promising selections.

Results of heritability studies indicated that nectar production is a highly heritable trait. Phenotypic recurrent selection would be an effective means of breeding for increased nectar production.