A PRELIMINARY INVESTIGATION OF OUTCROSSING RATES AND REPRODUCTIVE SUCCESS IN *XANTHORRHOEA JOHNSONII* IN SOUTH EAST QUEENSLAND, AUSTRALIA

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Outcrossing rates and seed set in *Xanthorrhoea johnsonii* (Lee) were measured at four different flowering densities (0.20, 0.16, 0.09, 0.02 plants m^{-2}) in Toohey Forest to investigate the relationship between outcrossing rates and seed set with respect to flowering densities. Plant height, inflorescence length and seed set were measured for one hundred plants from each of the four flowering densities. Allozyme data from progeny arrays of 20 seeds from ten plants at each flowering density were used to determine maternal outcrossing rates and correlated paternity. Significant levels of selfing were found in plants at the lowest flowering density (t_m=0.901 ± 0.016), the second highest flowering density (t_m = 0.956 ± 0.008) and the highest flowering density (t_m=0.948 ± 0.008). The significant levels of selfing found at the higher flowering densities suggest that during mass flowering events, geiteinogamous pollination can occur. The highest number of pollen donors in the progeny arrays (r_p=0.395 ± 0.028) occurred at the second lowest flowering density. Seed set measured as a rate per unit of inflorescence was lowest for plants at the lowest flowering density. The overall findings suggest that at low flowering densities, outcrossing rates and seed set are reduced. At intermediate flowering densities outcrossing rates, pollen donors and seed set remained high. These results have implications for the long-term genetic variability and viability of populations, especially at low effective population sizes. These preliminary findings are the basis of a more detailed study of outcrossing rates (using microsatellite markers) and flowering densities.