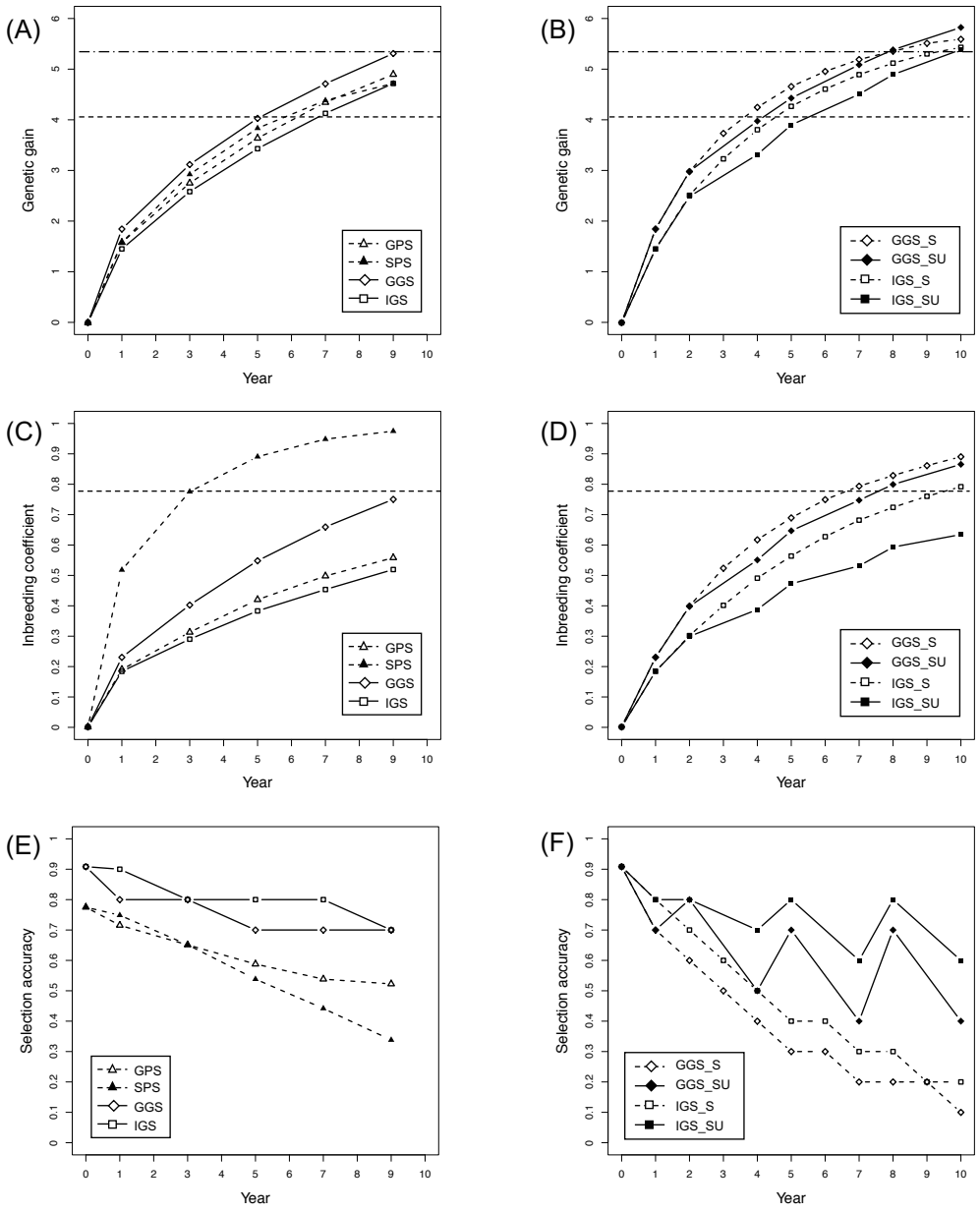
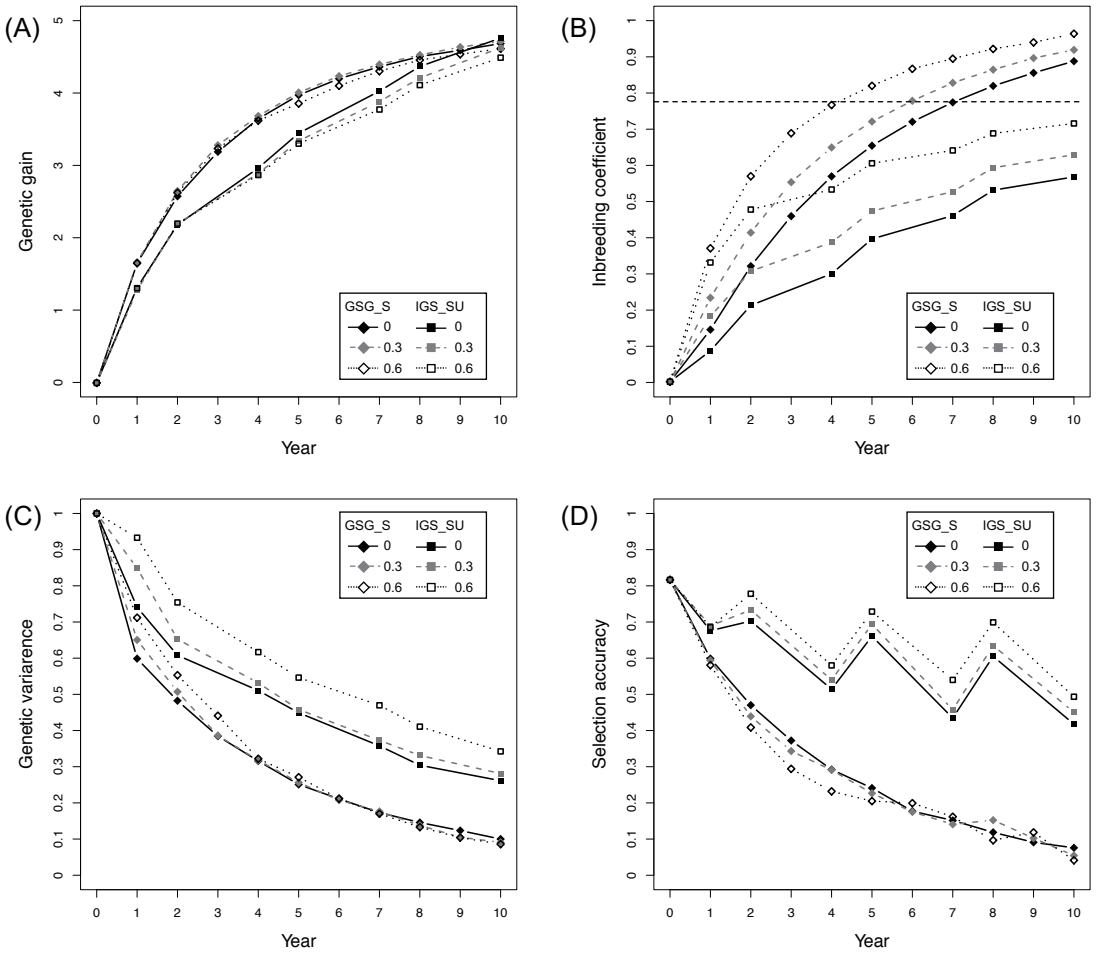


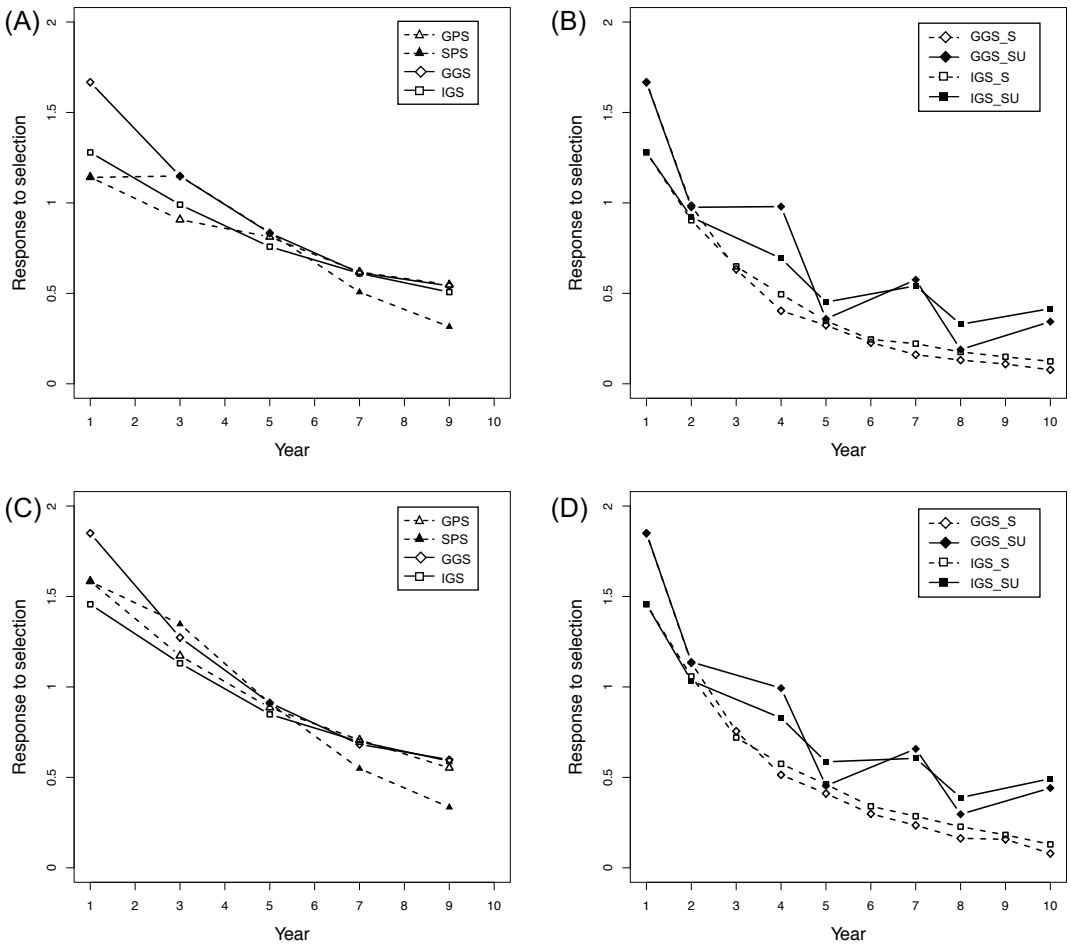

**Supplemental Fig. 1. Comparison of properties among the selection schemes with the setting of $h^2 = 0.6$**

The panels indicate the changing patterns of genetic gain **(A, B)**, inbreeding coefficient **(C, D)**, and selection accuracy **(E, F)** during the selection term with the setting of 200 n, 100 QTLs, 500 markers, and $h^2 = 0.6$. Horizontal dashed and two-dash lines in **(A, B)** correspond to the values of GGS in years 5 and 10, respectively. Horizontal dashed lines in **(C, D)** indicate the values of SPS in year 3 (corresponding to the $F_4$ generation), which was defined as the threshold for the occurrence of inbreeding depression in this study. The correlation coefficient between the genetic and predicted values was used to indicate the selection accuracy. In phenotype-based selection (i.e., GPS, and SPS), the correlation coefficient values between the genetic and phenotypic values represented the selection accuracy.




**Supplemental Fig. 2. Impact of self-pollination ratio**

Comparison of each property between different self-pollination ratios, with the setting of 200 n, 100 QTLs, 500 markers, and $h^2$ = 0.3 in GGS_S and IGS_SU. The panels indicate the genetic gain **(A)**, inbreeding coefficient **(B)**, genetic variance **(C)**, and selection accuracy **(D)**.




**Supplemental Fig. 3. Comparison of response to selection among the selection schemes**
The panels indicate the changing pattern of the response to selection, with the setting of 200 n, 100 QTLs, and 500 markers. The heritability of the target trait was set at $h^2 = 0.3$ **(A, B)** and $h^2 =$ 0.6 **(C, D)**.