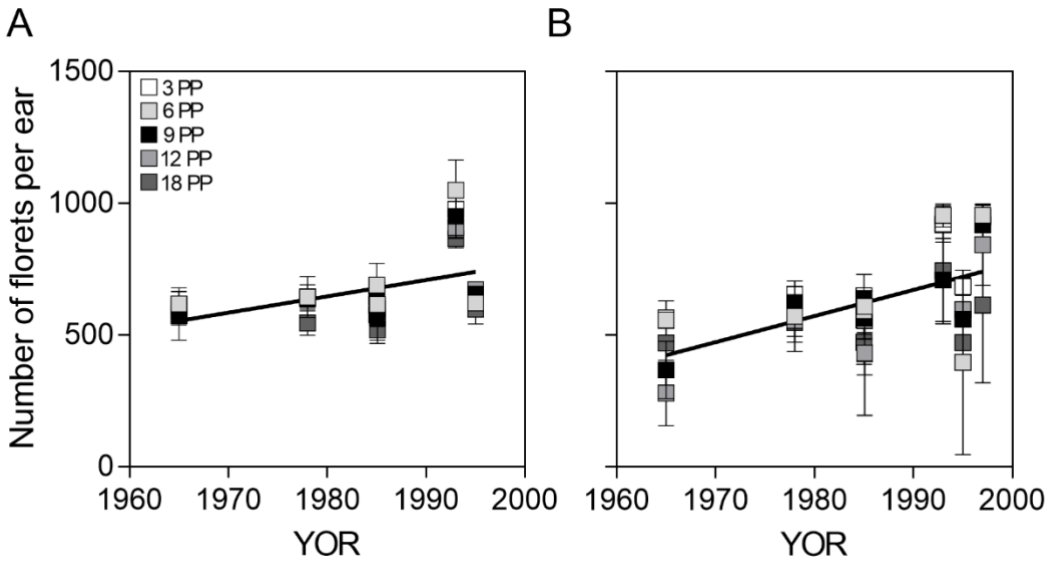
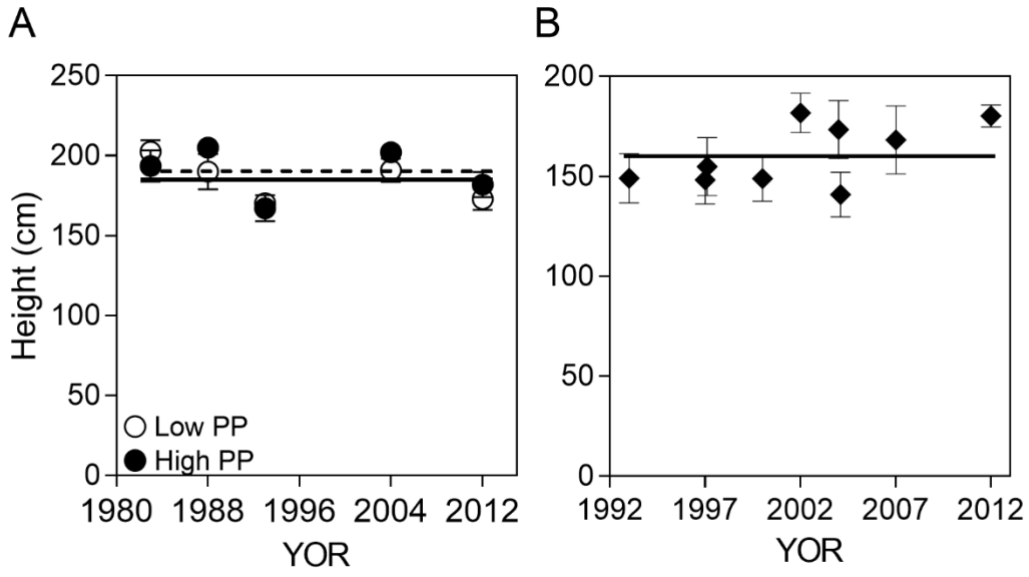
Cagnola et al.

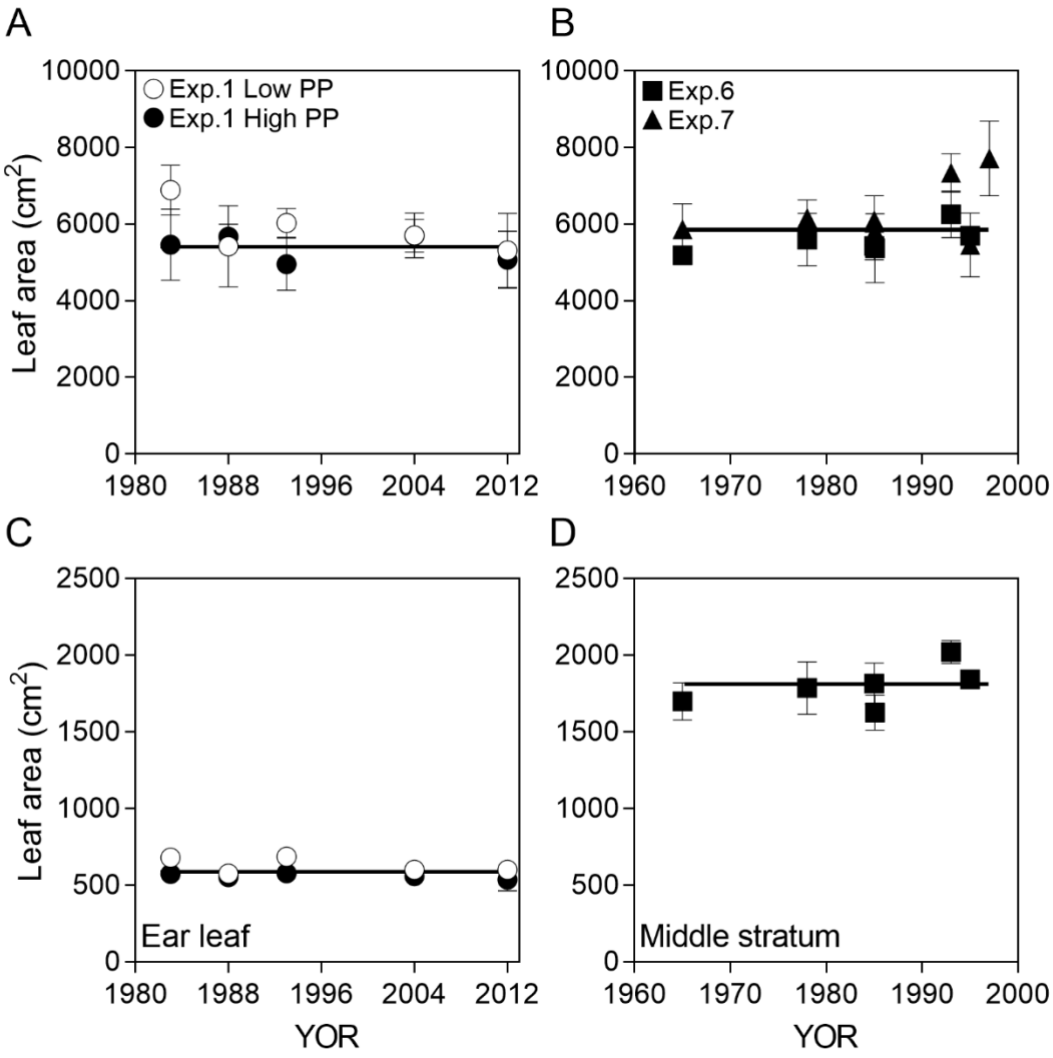
SUPPLEMENTARY FIGURES



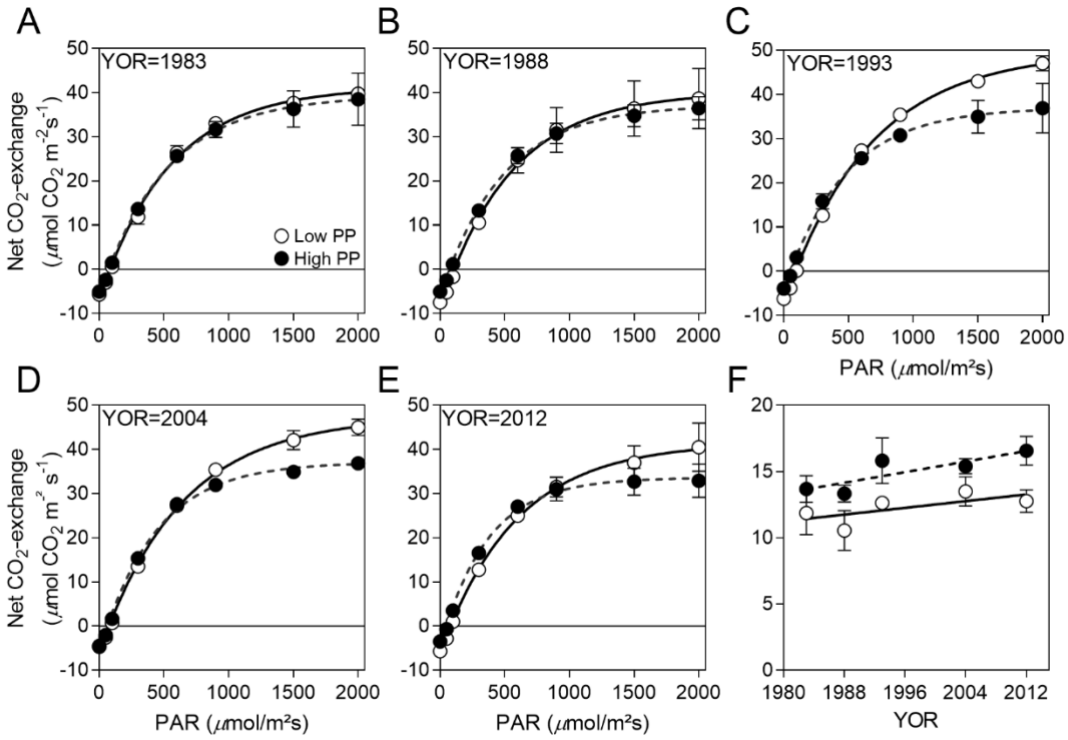
Supplementary Fig. S1: Breeding has increased the number of florets per ear in maize. Plants were grown at the indicated plant population density (PP) expressed in plants m^{-2}. Data are means and SE of three replicate plots from experiments 6 (a) and 7 (b). Lines indicate slopes significantly different from zero (p-value<0.05) when plotted against the year of release of the hybrid (YOR).



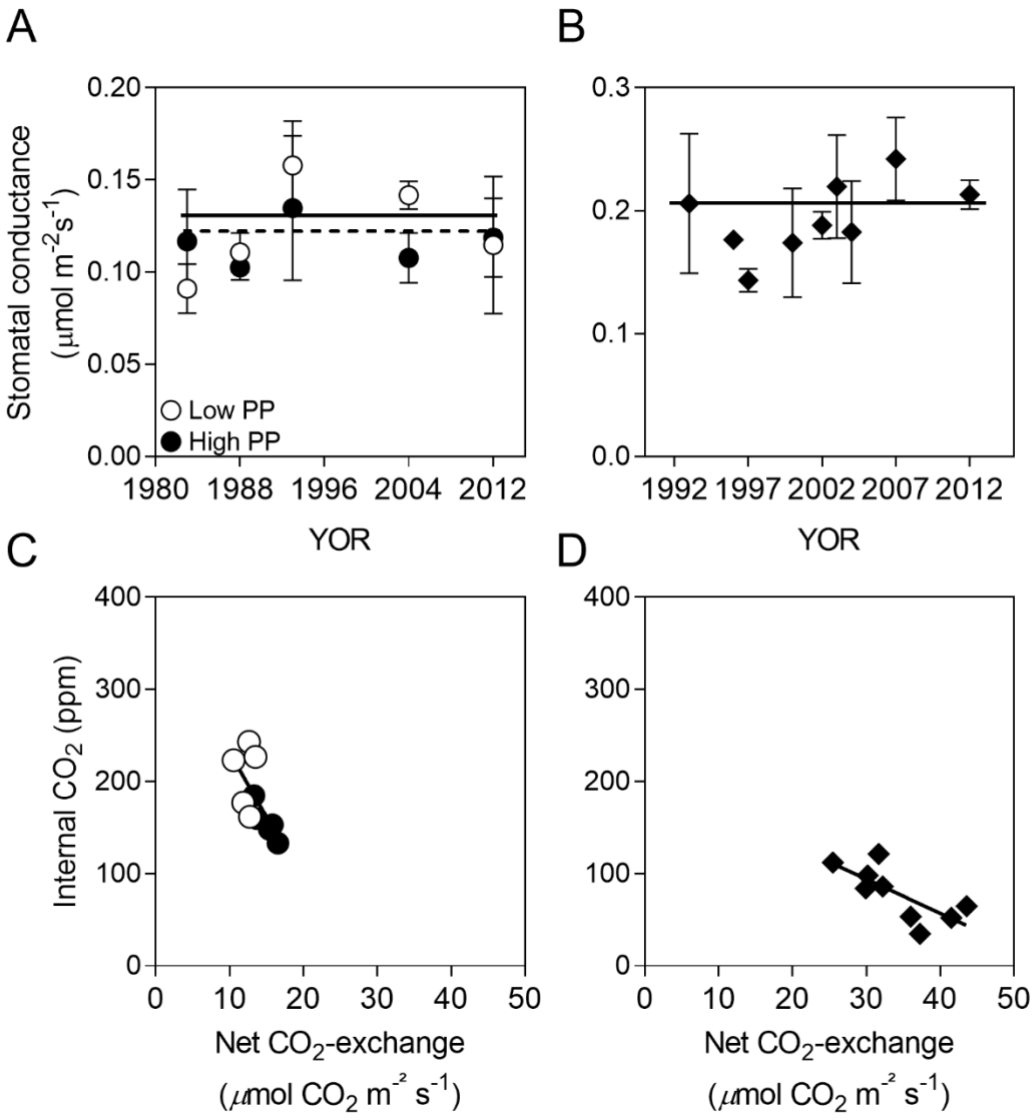
Supplementary Fig. S2: Breeding has not reduced plant stature in maize. Plant height at R2 is plotted against the year of release (YOR) of the hybrids. Data are means and SE (whenever larger than the symbols) of three replicate plots from experiment (Exp.) 1 (a, Low PP: 4 plants m^{-2}; high PP= 8 plants m^{-2}) and Exp.5 (b, PP= 9 plants m^{-2}). Horizontal lines indicate slopes not significantly different from zero (p-value >0.05).



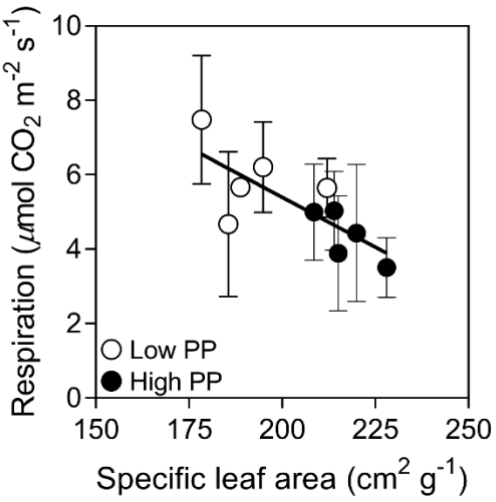
Supplementary Fig. S3: Breeding has not changed leaf area in maize. Total leaf area (a-b), ear leaf area (c) and middle stratum leaf area (d) at R1 (PP= 9 plants m^{-2}) plotted against the year of release (YOR) of the hybrids. In (a), total leaf area was calculated according to Razquín et al., 2017 (Agriscientia 34, 27-34). In (b, d), total leaf and middle stratum leaf area are the sum of the leaf area of all the leaves of the plant or the middle stratum. Data are means and SE of three replicate plots from experiments (Exp.) 1 (a, c), 6 (b, d) and 7 (d). Horizontal lines indicate slopes not significantly different from zero (p-value >0.05).



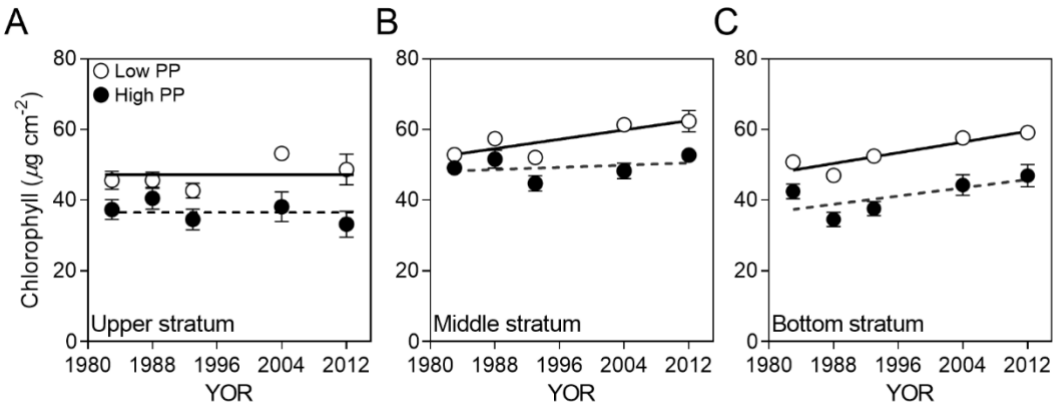
Supplementary Fig. S4: Net CO_2 exchange responses to PAR**.** Low PP: 4 plants m^{-2}; high PP= 8 plants m^{-2}. Data are means and SE of three replicate plots from experiment 1. See the model that fits the data and its parameters in Spplementary Table S3. F, Net CO_2 exchange at PAR= 300 μmol m^{-2} s^{-1}.



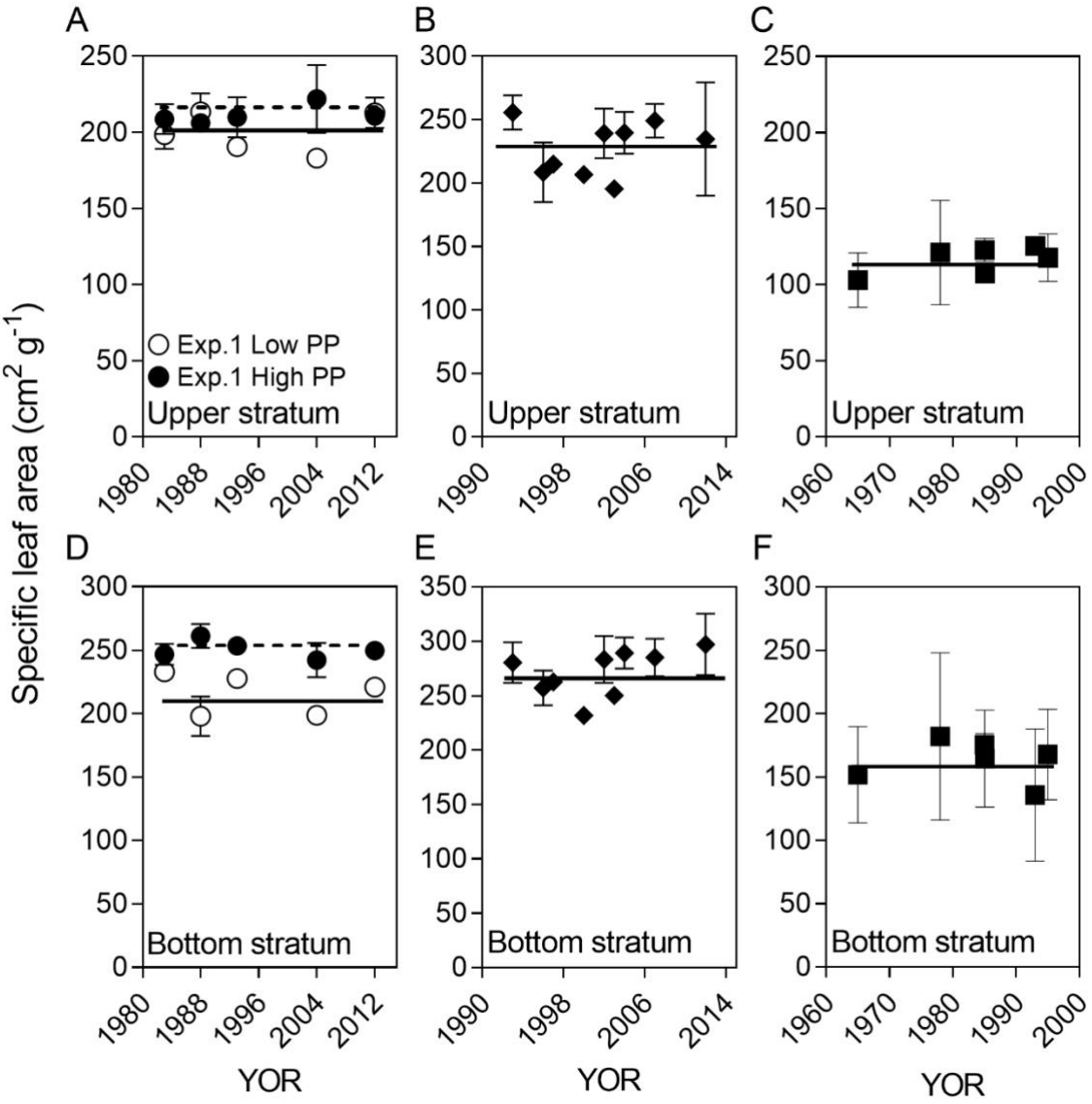
Supplementary Fig. S5: Stomatal conductance (a, b) and CO_2 internal concentration (c, d) in maize hybrids. Plants were grown at high plant population densities (PP, 8-9 plants m^{-2}) except for the low PP condition (4 plants m^{-2}) in (a, c). Data are means and SE of three replicate plots from experiments 1 (a, c) and 5 (b, d). Lines indicate slopes significantly different from zero (p-value<0.05), unless they are horizontal.



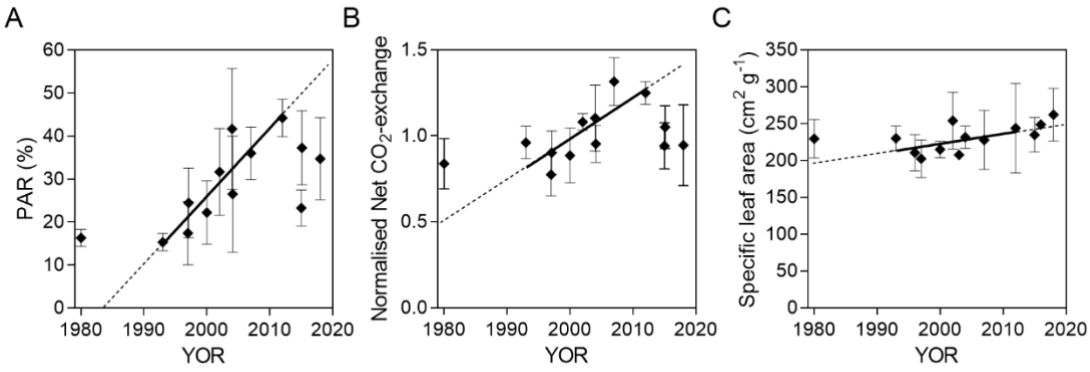
Supplementary Fig. S6: Respiration correlates with specific leaf area. Low PP: 4 plants m^{-2}; high PP= 8 plants m^{-2}. Data are means and SE of three plots from experiment 1. The line indicates that the slope is significantly different from zero (p-value<0.05).



Supplementary Fig. S7: Chlorophyll content at three different strata of the canopy of the maize canopy. Low PP: 4 plants m^{-2}; high PP= 8 plants m^{-2}. Data are means and SE of three replicate plots from experiment 1. Lines indicate slopes significantly different from zero (p-value<0.05).



Supplementary Fig. S8: Specific leaf area. Values corresponding to the uppermost (a-c) or lowermost (d-f) strata of the canopy plotted against the year or release (YOR) of the hybrid. Data are means and SE of three replicate plots from experiments 1 (a, d), 5 (b, e) and 6 (c, f). Horizontal lines indicate slopes not significantly different from zero (p-value >0.05).



Supplementary Fig. S9: Analysis of additional hybrids demonstrates that beneficial physiological traits can be lost during breeding programs when these traits are not evaluated. PAR (a), net CO_2 exchange (normalised to the average, b) and specific leaf area plotted against the year of release of the hybrid (YOR). Data are the same presented in Figs 4, 3b and 7b, respectively, with the addition of four hybrids (DK2F10 [1980], DK7020 [2015], DK7320 [2015] and DK7270 [2018]), which were present in the experiment shared with other scientists but did not fulfil the criteria of wide acceptance for inclusion in our analysis. Data are means and SE of three replicate plots from experiment 5. Lines indicate slopes significantly different from zero (p-value<0.05) when plotted against the year of release of the hybrid (YOR).