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*Supplement of*

## **Optimizing cropland cover for stable food production in Sub-Saharan Africa using simulated yield and Modern Portfolio Theory**

**P. Bodin et al.**

*Correspondence to:* P. Bodin ([per.e.bodin@gmail.com](mailto:per.e.bodin@gmail.com))

## Supplementary material

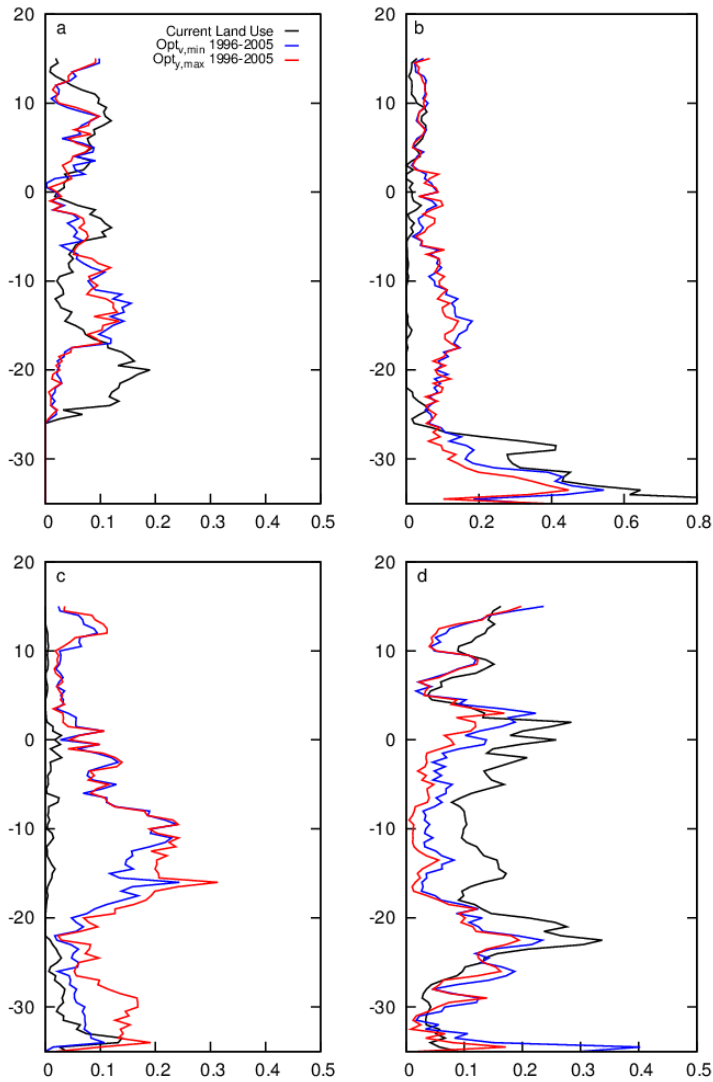


Figure S1. Optimized latitudinal mean crop distributions for current climate (1996-2005) ( $Opt_{v,min}$  solid blue lines;  $Opt_{y,max}$  solid red lines) and observed crop distributions (black lines) for: TrRi (a), TeWW (b), TeSb (c) and TePu (d)

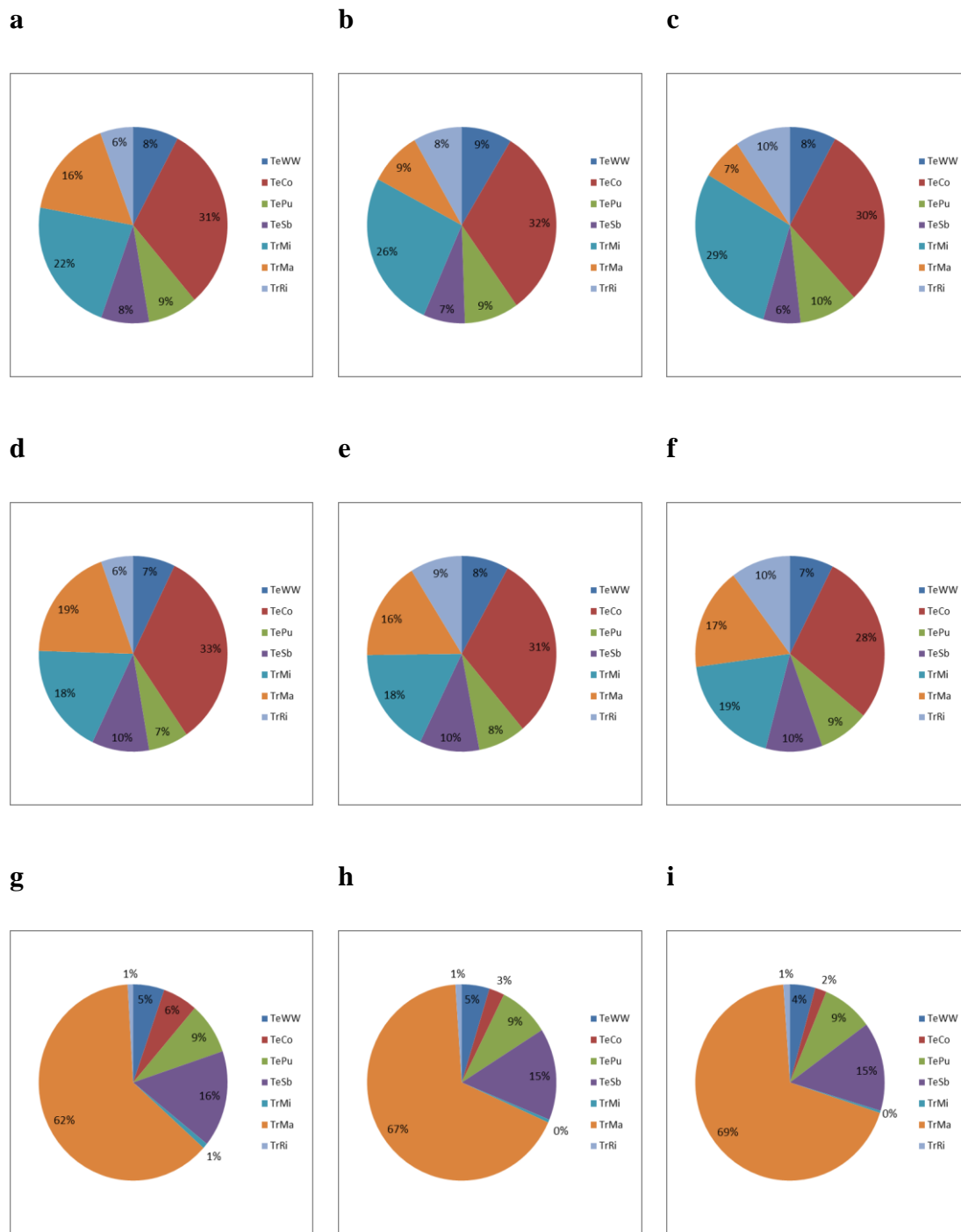


Figure S2. Optimized cropland distribution for  $Opt_{v,min}$  (a-c),  $Opt_{y,max}$  (d-f) and  $Opt_{s,crop}$  (g-i). The left panels represent the time period 1999-2005, the center 2056-2065, and the right panels 2081-2090.

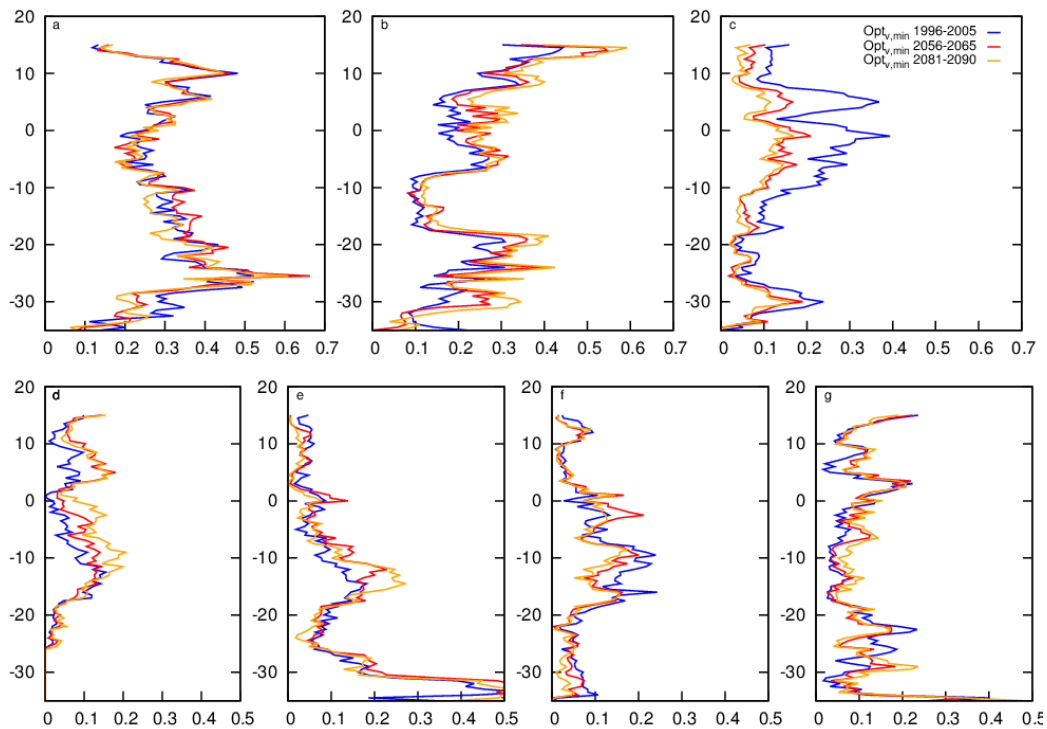


Figure S3. Optimized latitudinal mean crop distribution using  $Opt_{v,min}$  for the three time periods (1996-2005: blue lines; 2056-2065: red lines; 2081-2090: orange lines) for: TeCo (a), TrMi (b), TrMa (c) TrRi (d), TeWW (e), TeSb (f) and TePu (g)

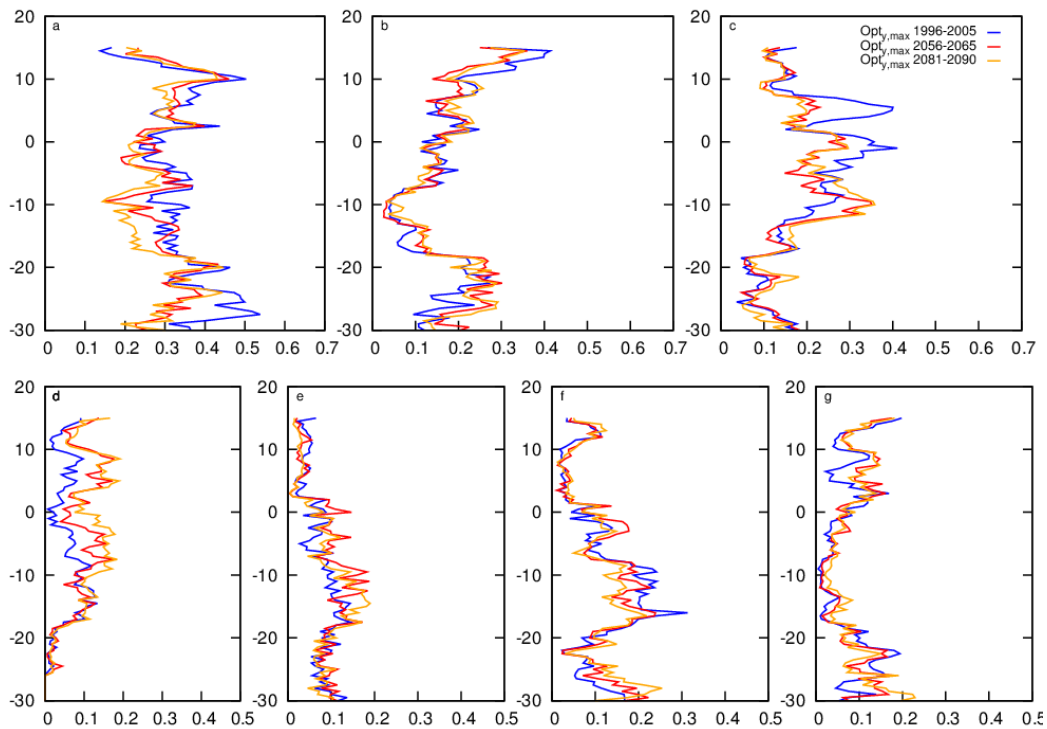


Figure S4. Optimized latitudinal mean crop distribution using  $Opt_{y,max}$  for the three time periods (1996-2005: blue lines; 2056-2065: red lines; 2081-2090: orange lines) for: TeCo (a), TrMi (b), TrMa (c) TrRi (d), TeWW (e), TeSb (f) and TePu (g).

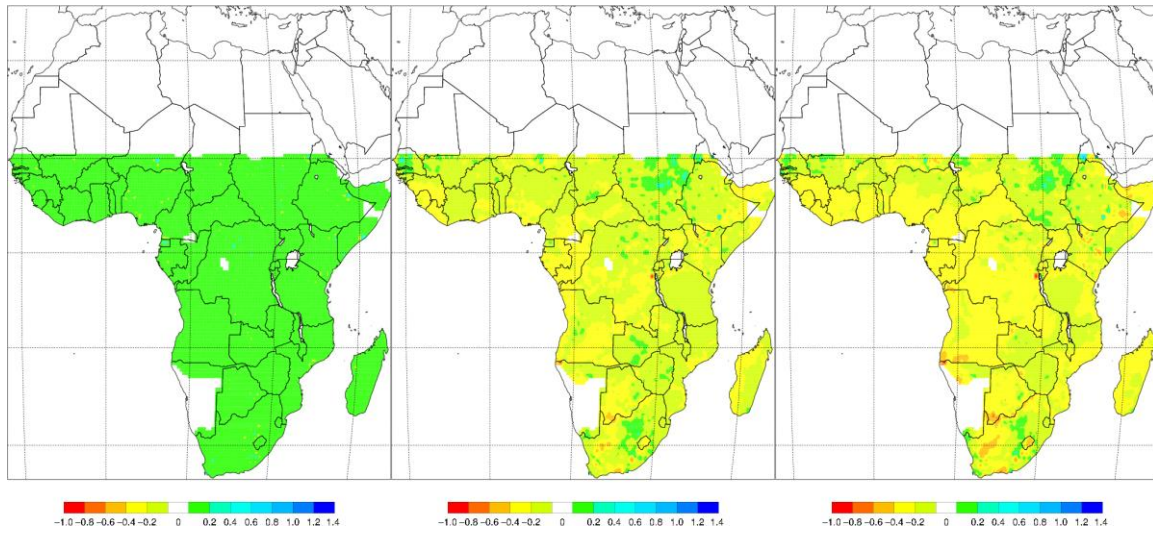


Figure S5. Relative difference in yield compared to assuming current land use fractions for  $Opt_{v,min}$  for the years 1996-2005 (a), 2056-2065 (b) and 2081-2090 (c).

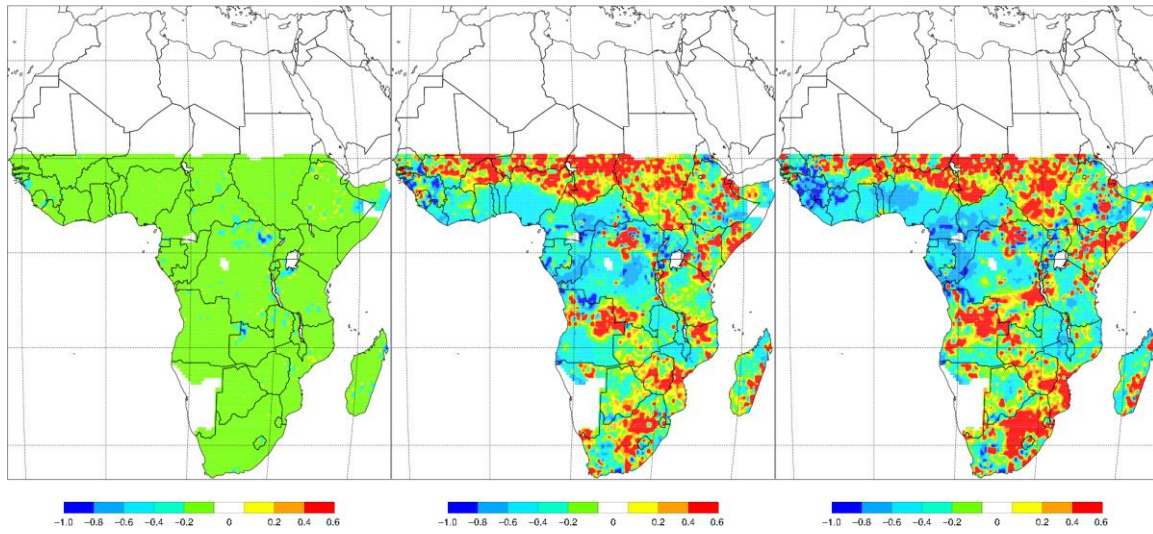


Figure S6. Relative difference in variance compared to assuming current land use fractions for  $Opt_{y,max}$  for the years 1996-2005 (a), 2056-2065 (b) and 2081-2090 (c).

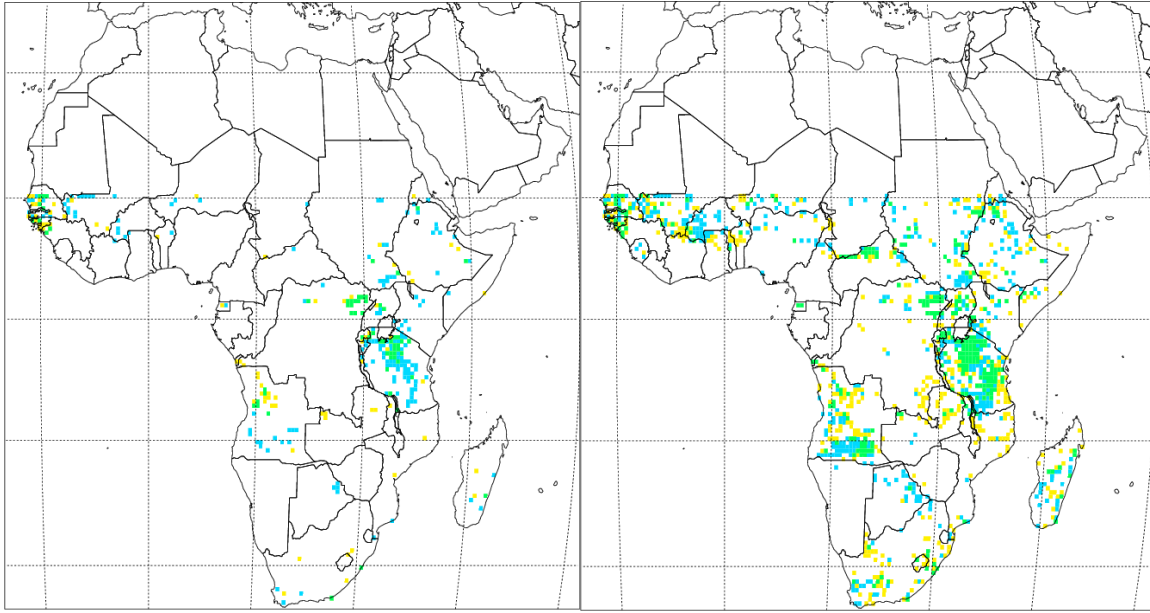


Figure S7. Grid cells where  $Opt_{y,max}$  generated both an increase in yield and a decrease in variance >25% (left) or >10% (right) for the time period 2056-2065 (yellow); 2081-2090 (blue) or both time periods (green).