

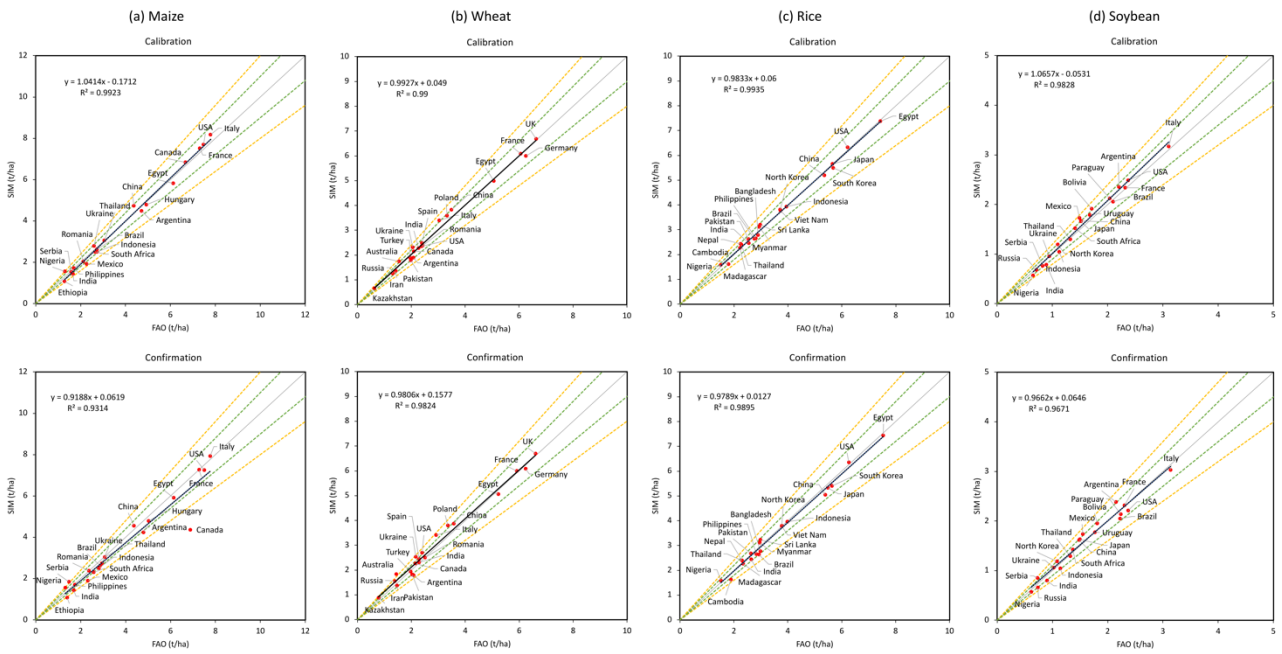
Supplementary material for:

Simulation of crop yield using the global hydrological model H08 (v.crp1)

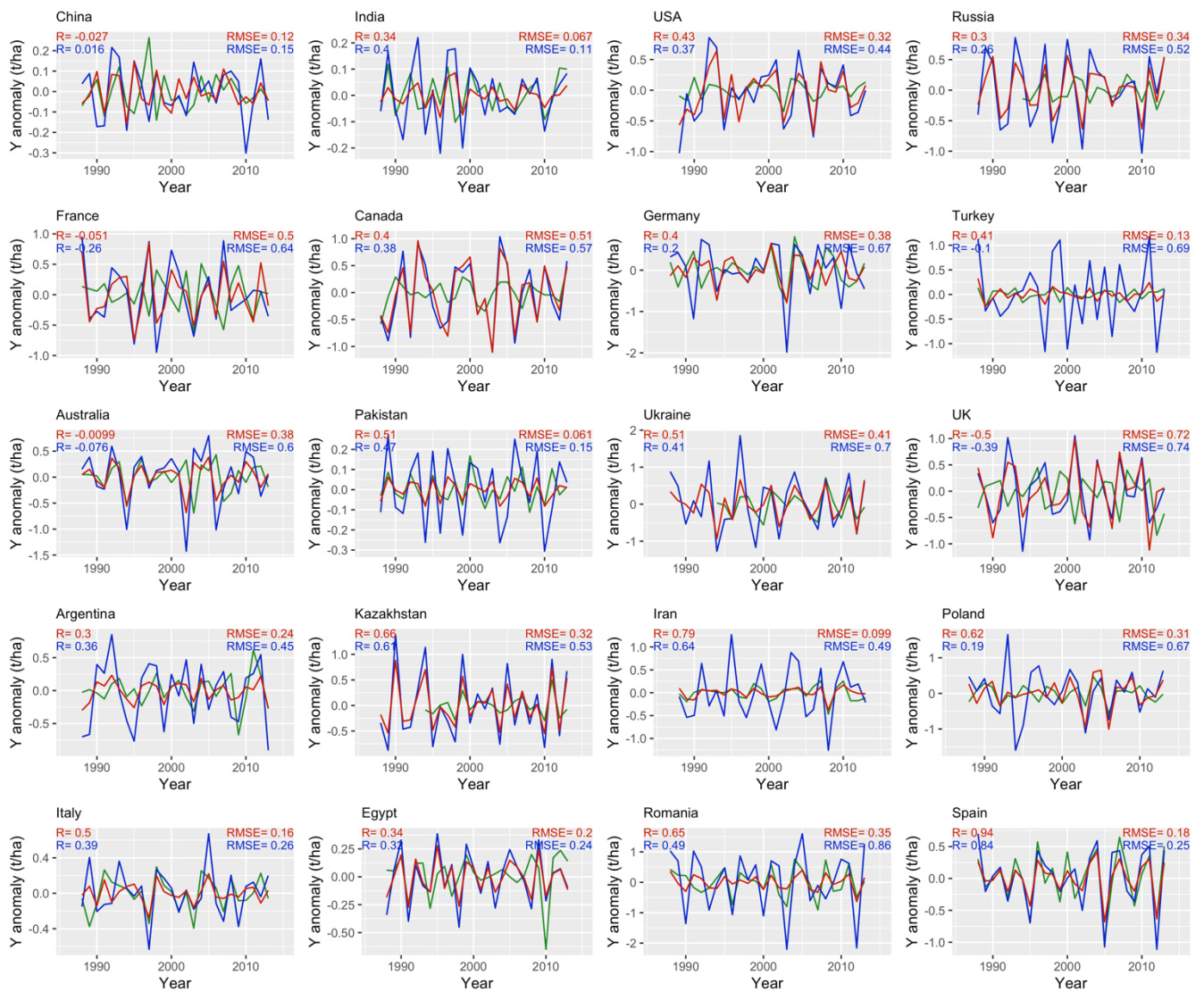
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5 Fig. S1 Comparison of mean simulated yield and mean FAO yield for the top 20 largest producer countries for the calibration and confirmation period, respectively. Dashed green and yellow lines indicate $\pm 10\%$ and $\pm 20\%$ differences, respectively. SIM denotes simulated yield and FAO denotes reported yield from FAO. Panel (a) for maize, (b) for wheat, (c) for rice, and (d) for soybean, respectively.



10 Fig. S2 Time series detrended wheat yield anomalies from improved simulation (red), default simulation (blue), and FAO (green) for the top 20 largest producer countries. Y, yield; R, correlation coefficient; RMSE, root mean square error.

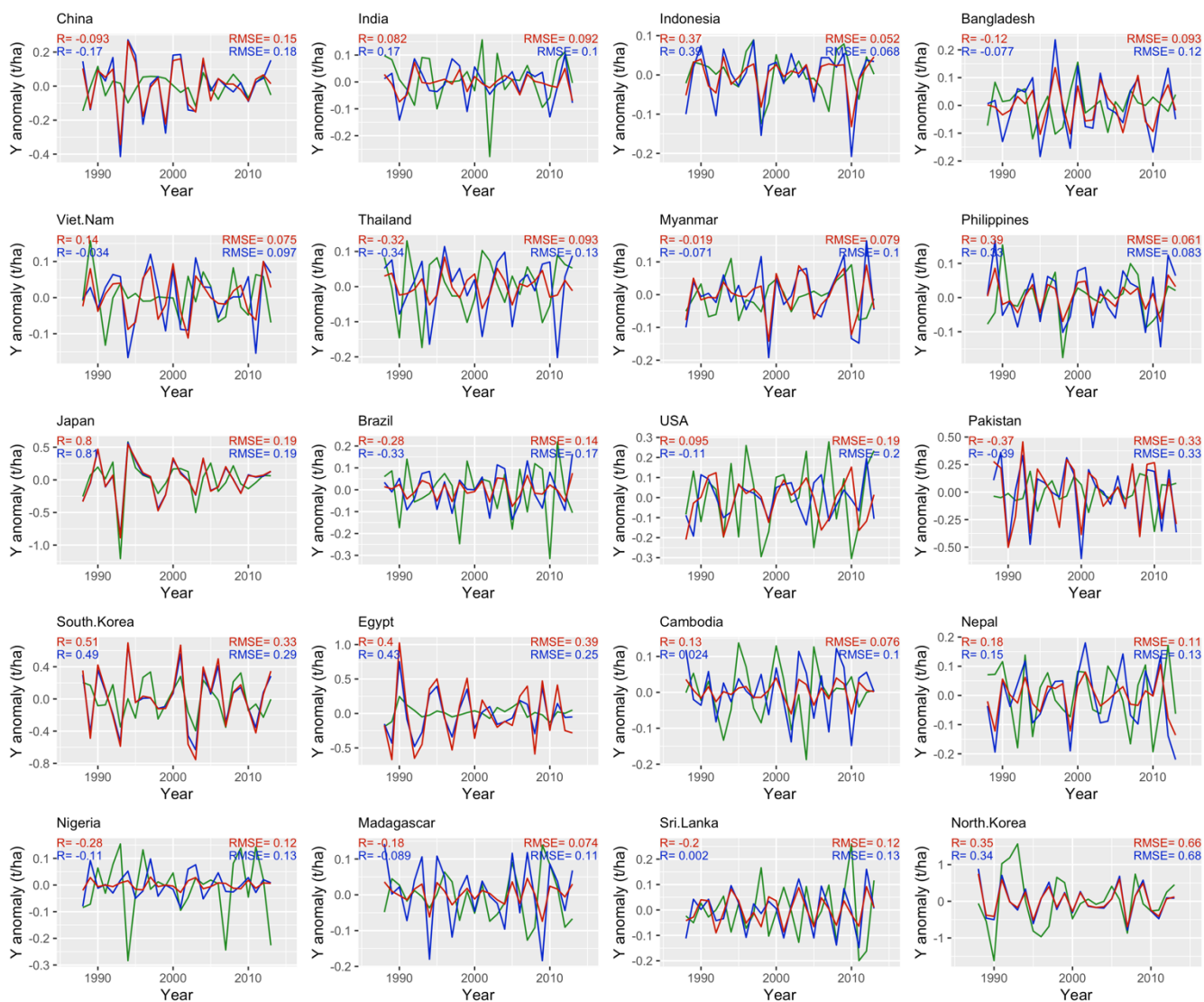
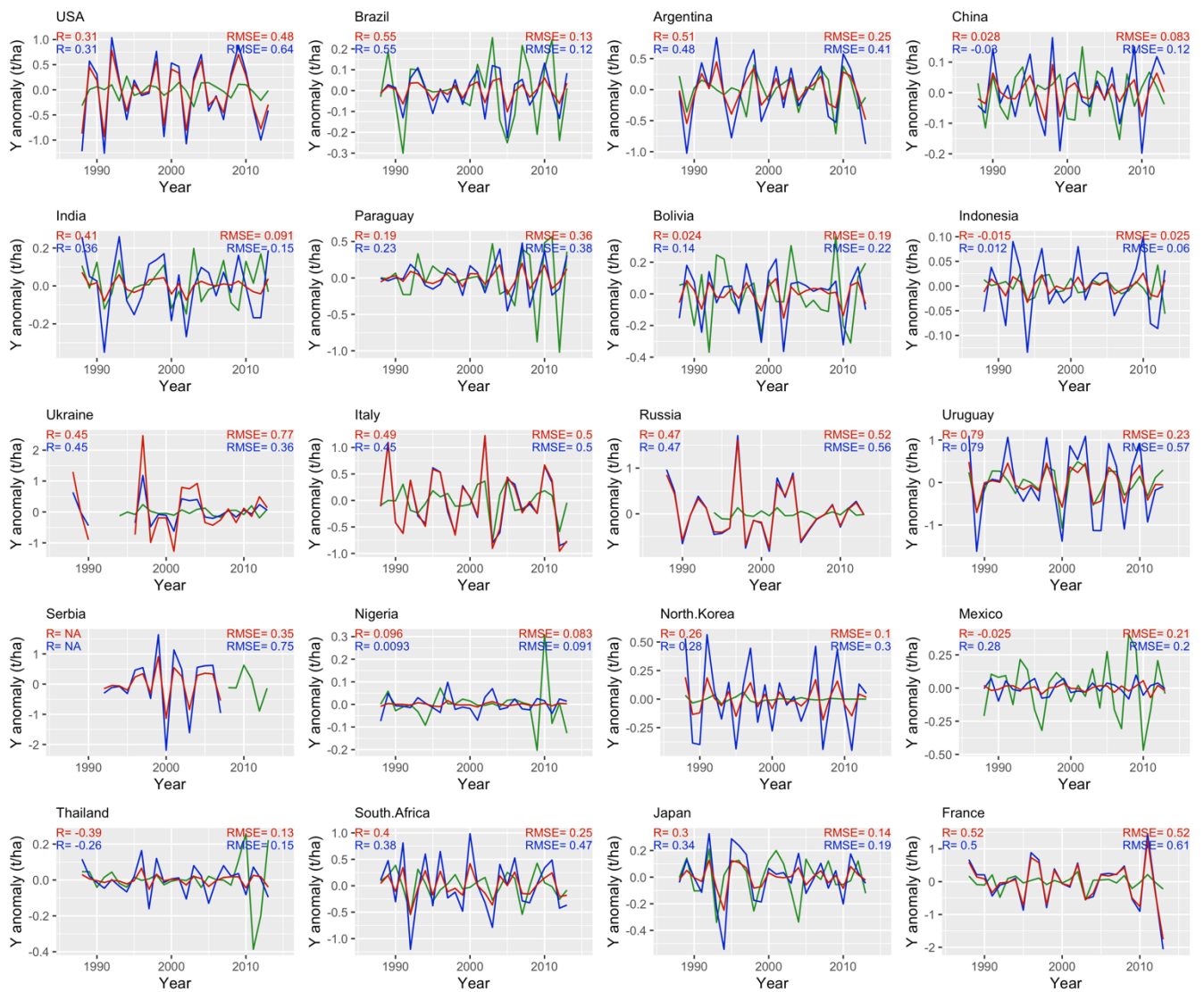


Fig. S3 Time series detrended rice yield anomalies from improved simulation (red), default simulation (blue), and FAO (green) for the top 20 largest producer countries. Y, yield; R, correlation coefficient; RMSE, root mean square error.



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Fig. S4 Time series detrended soybean yield anomalies from improved simulation (red), default simulation (blue), and FAO (green) for the top 20 largest producer countries. Y, yield; R, correlation coefficient; RMSE, root mean square error

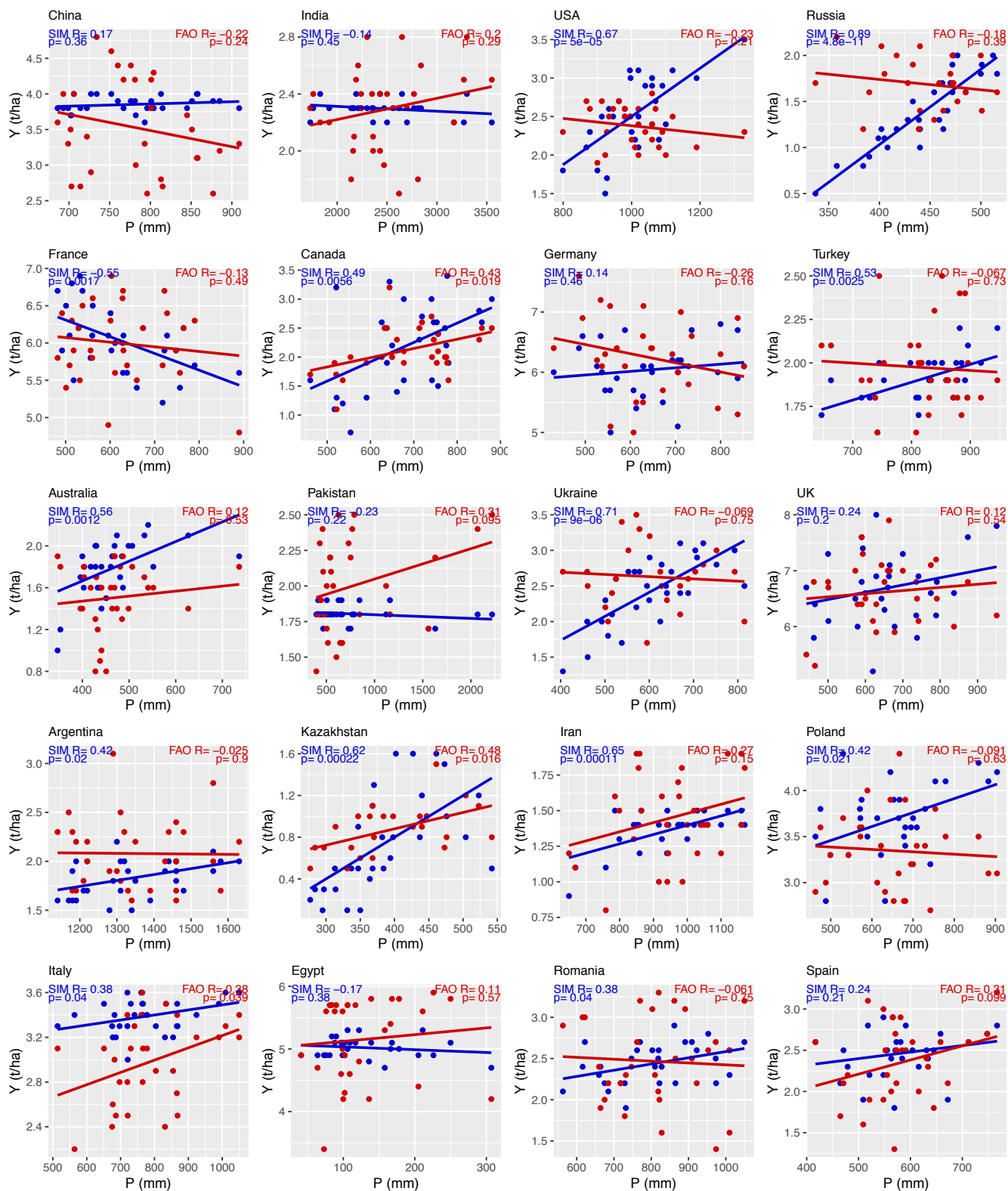


Fig. S5 Relationship between wheat yield (blue: simulated; red: FAO) and total precipitation in the growing season from 1986 to 2015 for the top 20 largest producer countries. Y, yield; P, precipitation; R, correlation coefficient.

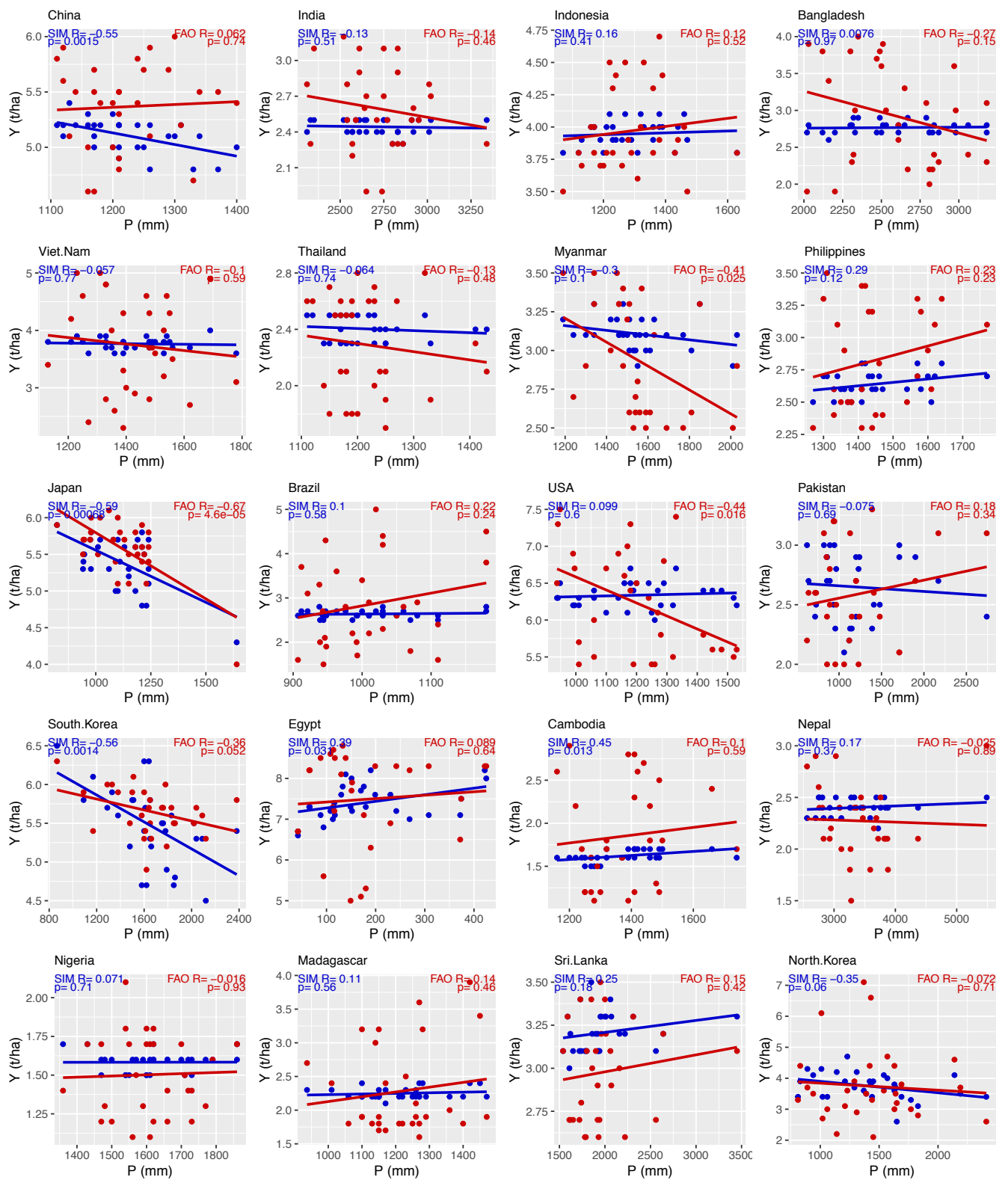
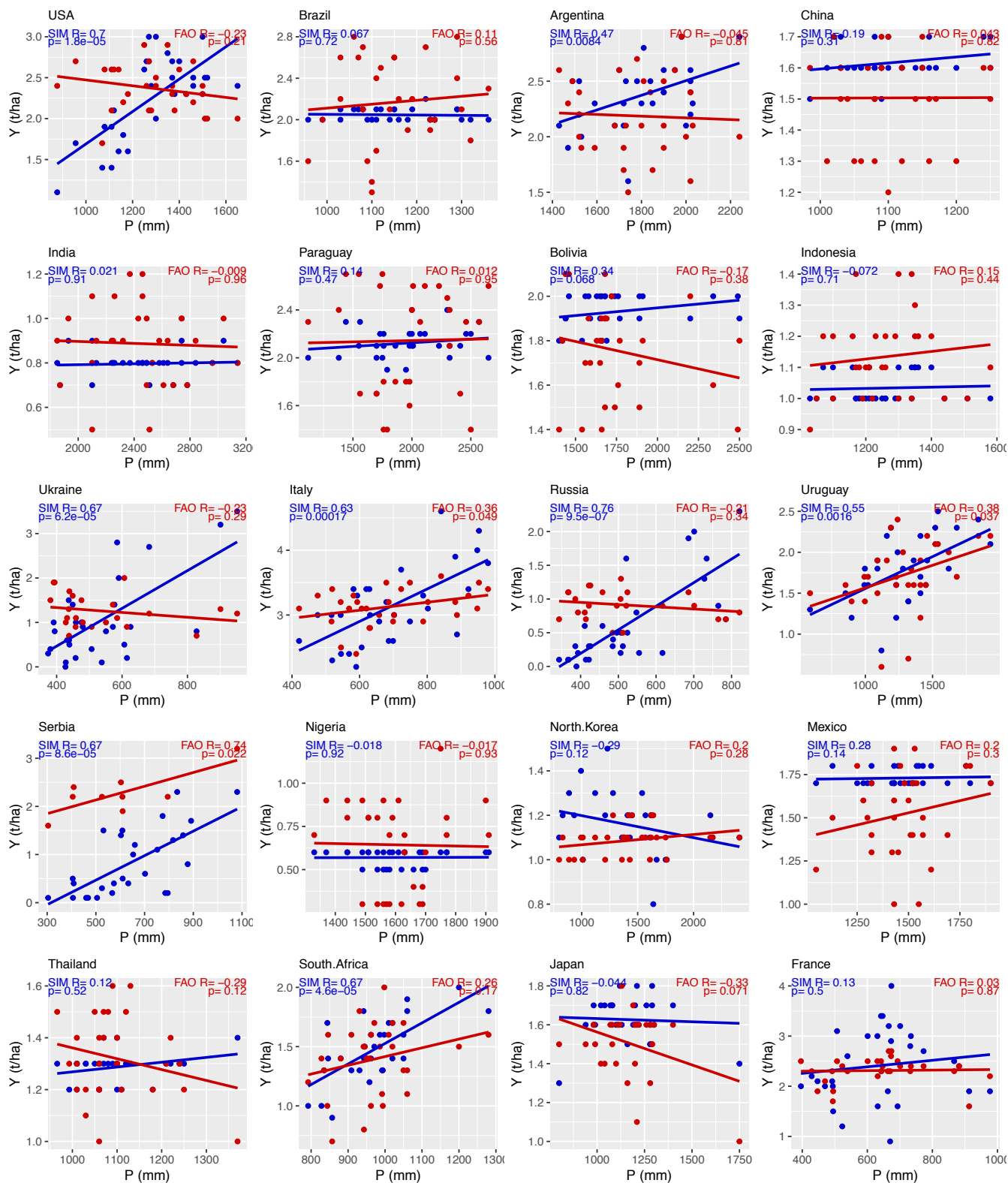


Fig. S6 Relationship between rice yield (blue: simulated; red: FAO) and total precipitation in the growing season from 1986 to 2015 for the top 20 largest producer countries. Y, yield; P, precipitation; R, correlation coefficient.



25 Fig. S7 Relationship between soybean yield (blue: simulated; red: FAO) and total precipitation in the growing season from 1986 to 2015 for the top 20 largest producer countries. Y, yield; P, precipitation; R, correlation coefficient.

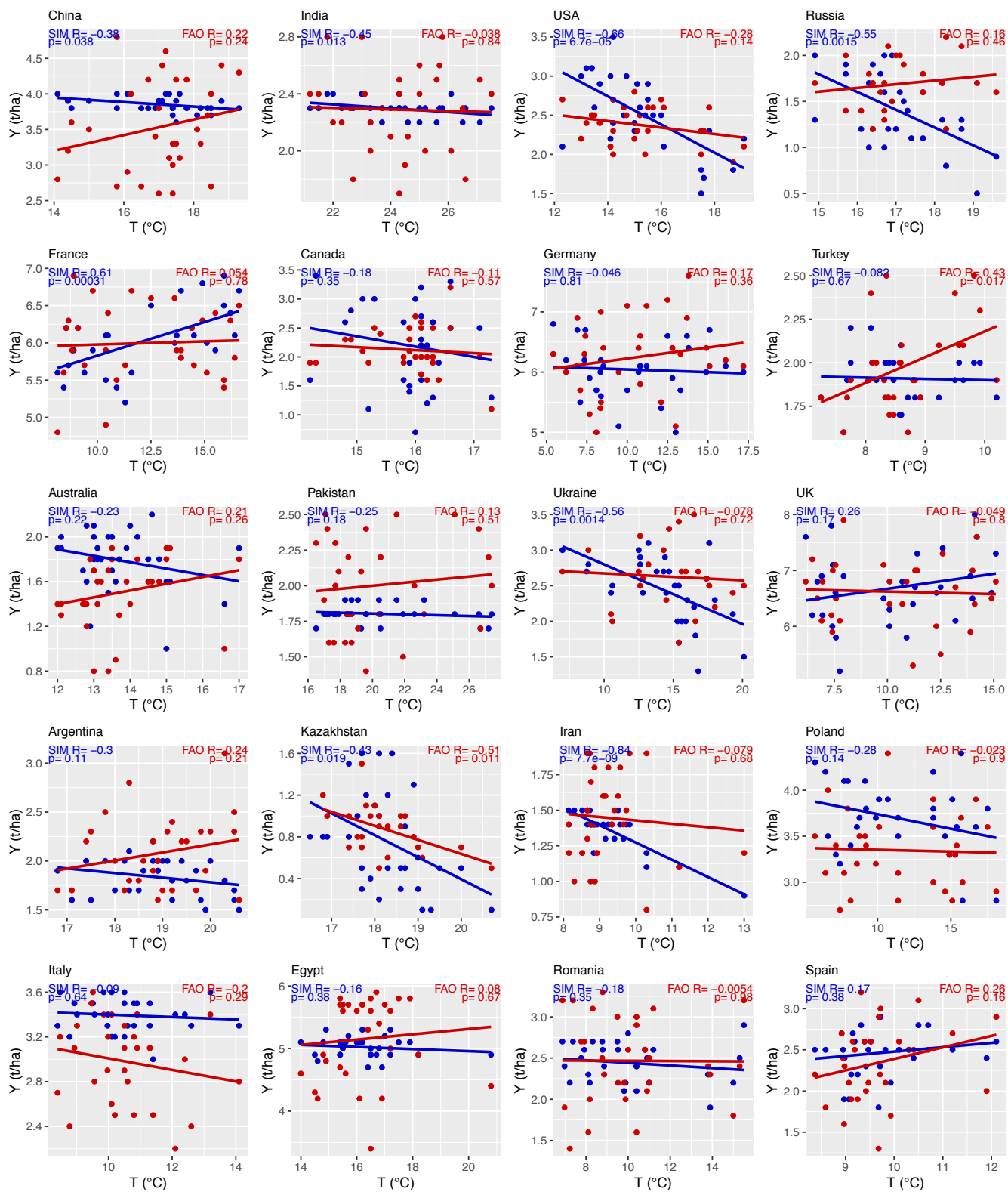


Fig. S8 Relationship between wheat yield (blue: simulated; red: FAO) and mean air temperature in the growing season from 1986 to 2015 for the top 20 largest producer countries. Y, yield, T, air temperature; R, correlation coefficient.

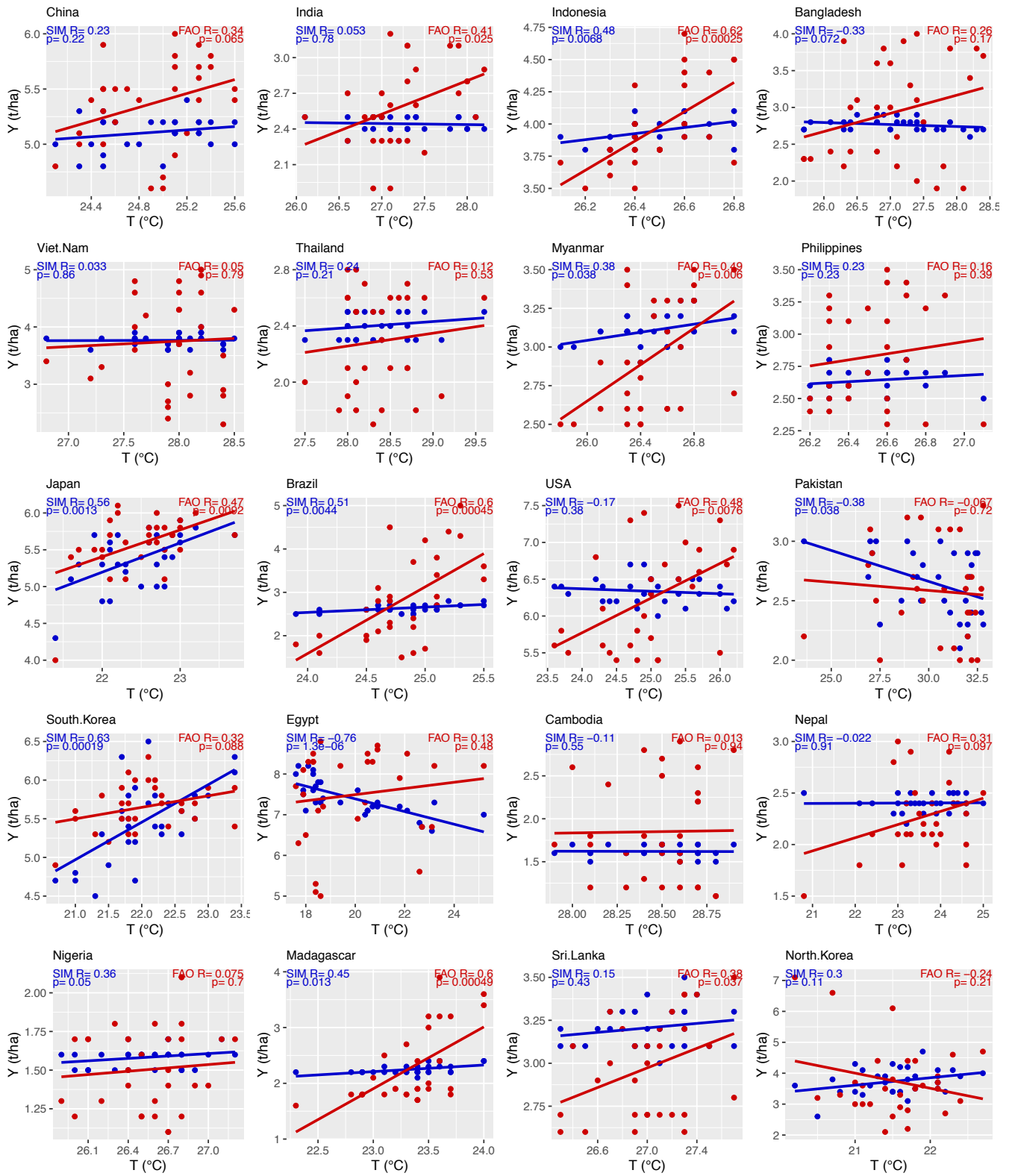
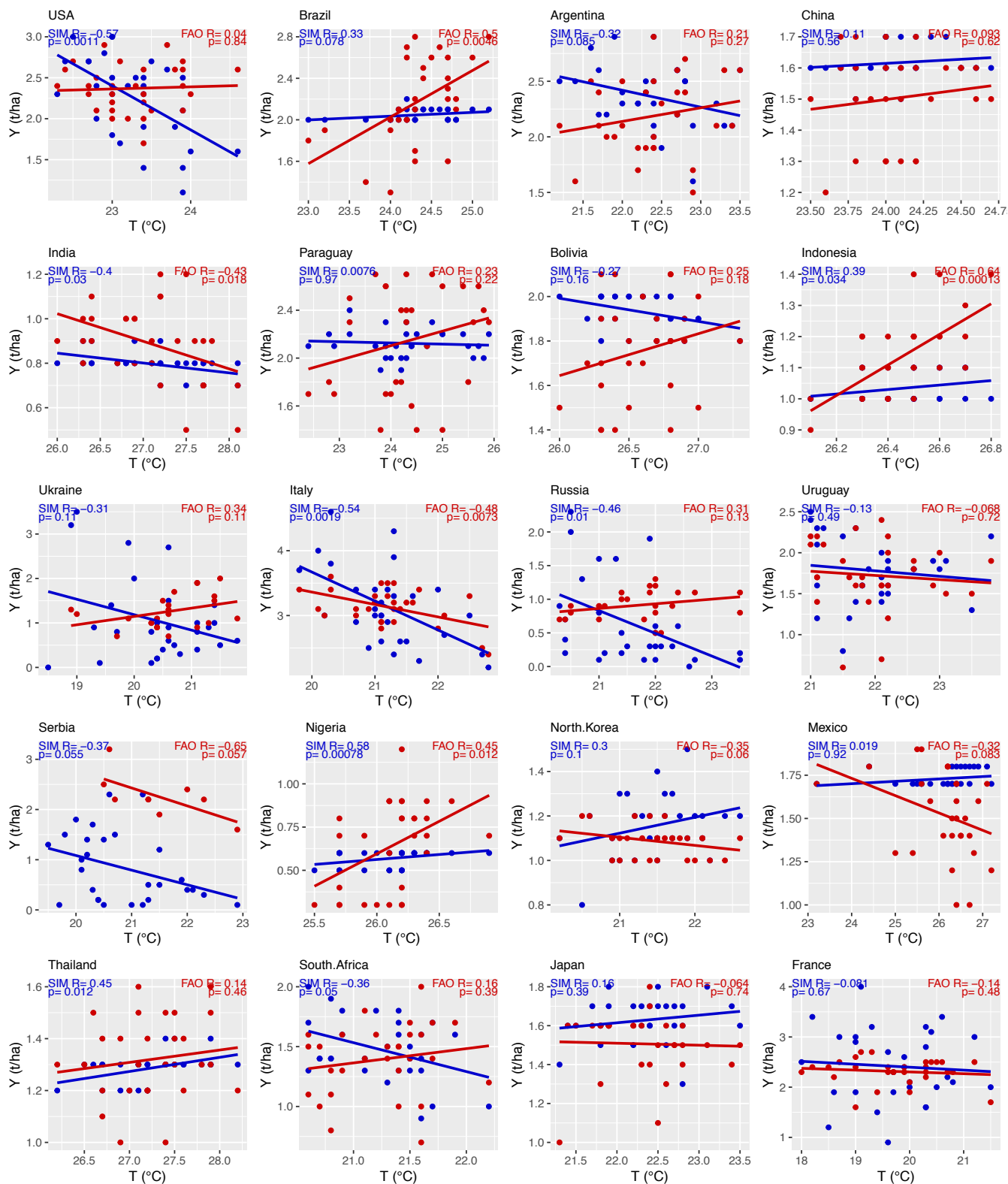
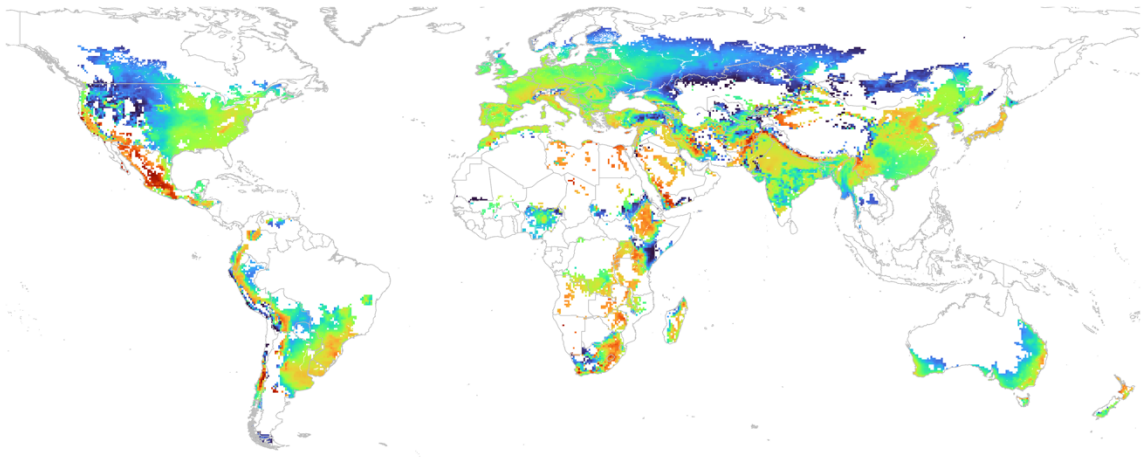


Fig. S9 Relationship between rice yield (blue: simulated; red: FAO) and mean air temperature in the growing season from 1986 to 2015 for the top 20 largest producer countries. Y, yield, T, air temperature; R, correlation coefficient.

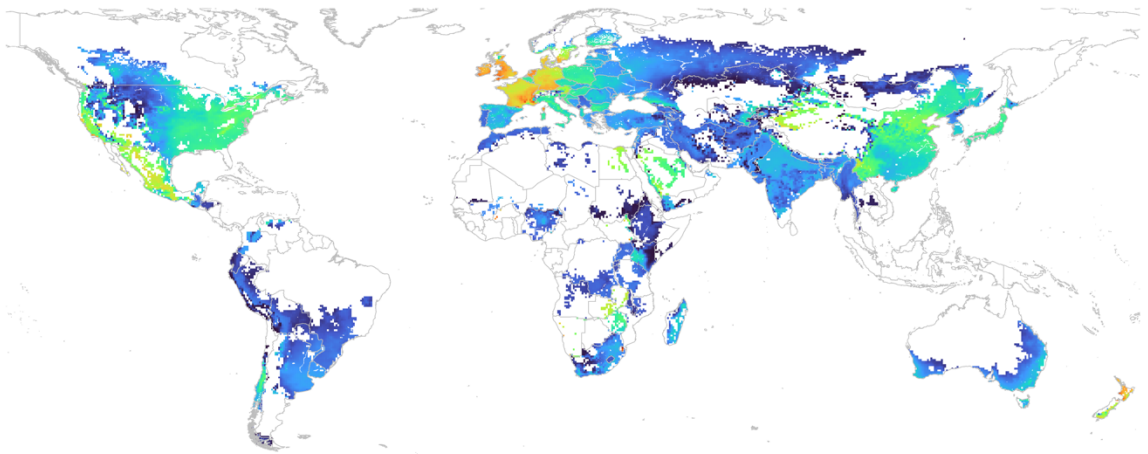


35 Fig. S10 Relationship between soybean yield (blue: simulated; red: FAO) and mean air temperature in the growing season from 1986 to 2015 for the top 20 largest producer countries. Y, yield, T, air temperature; R, correlation coefficient.

(a)



(b)



(c)

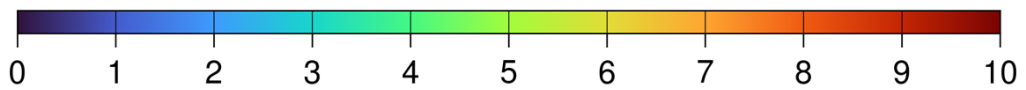
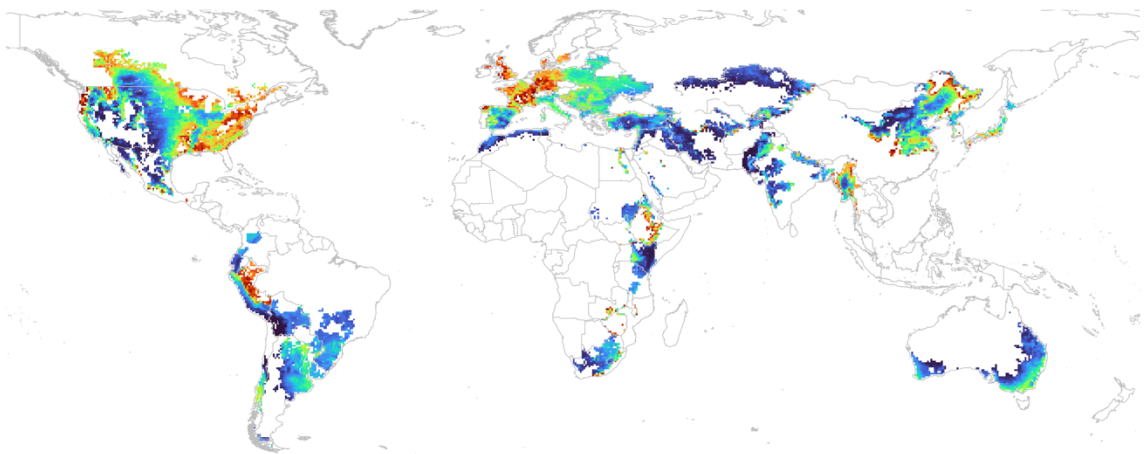
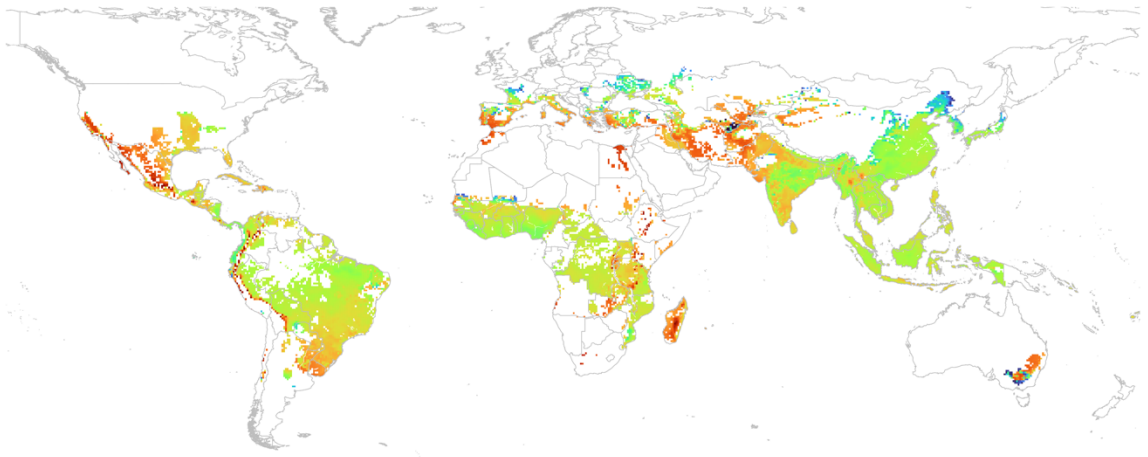
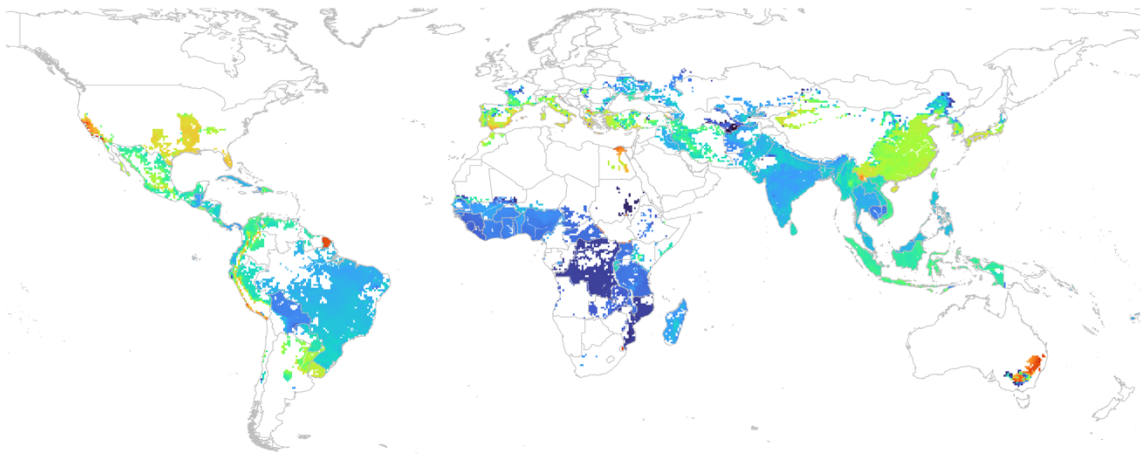


Fig. S11 Spatial distribution of the mean (1986-2015) simulated yield (a, default; b, improved) and GDHY yield (c) of wheat. Units in the legend are t/ha.

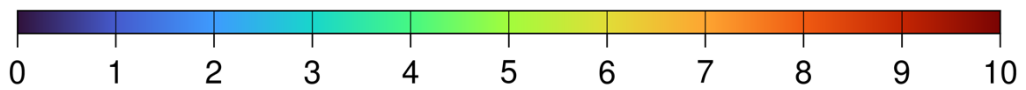
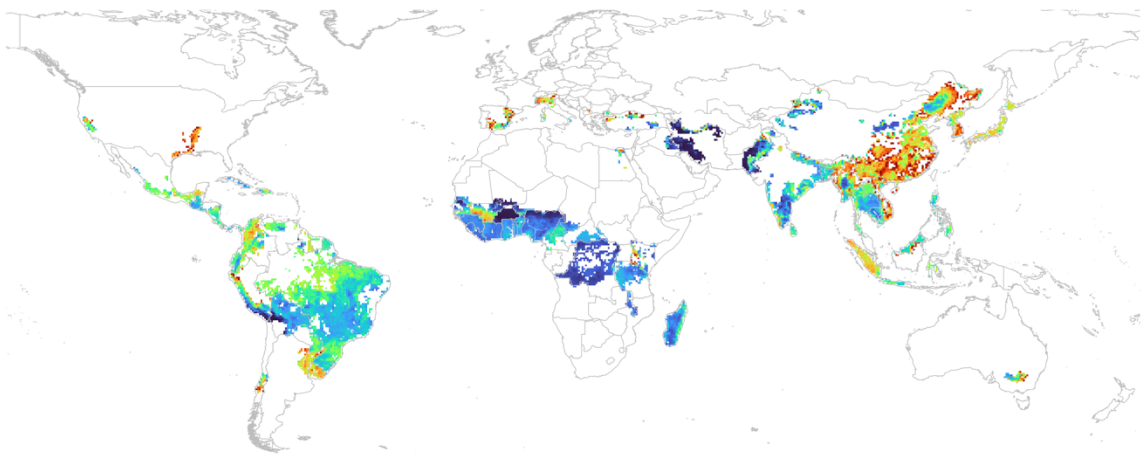
(a)



(b)



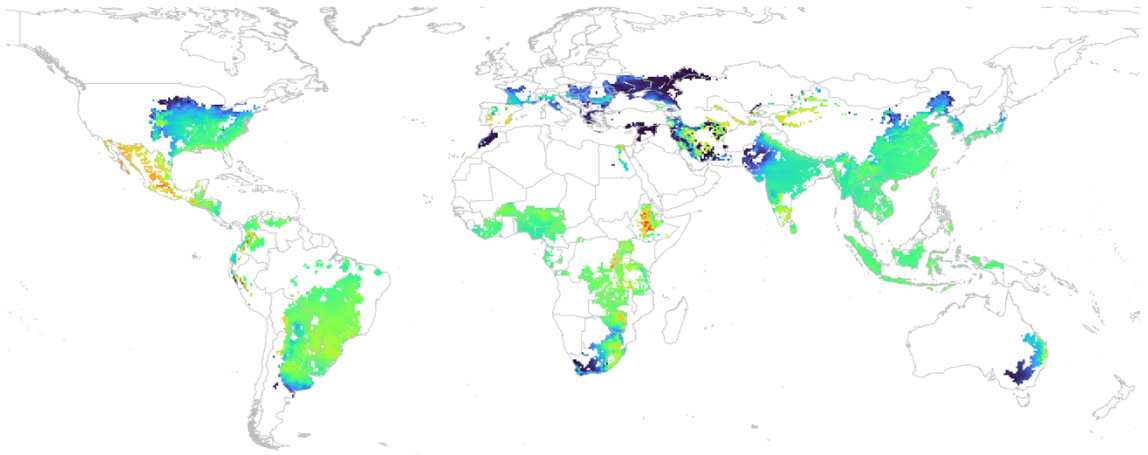
(c)



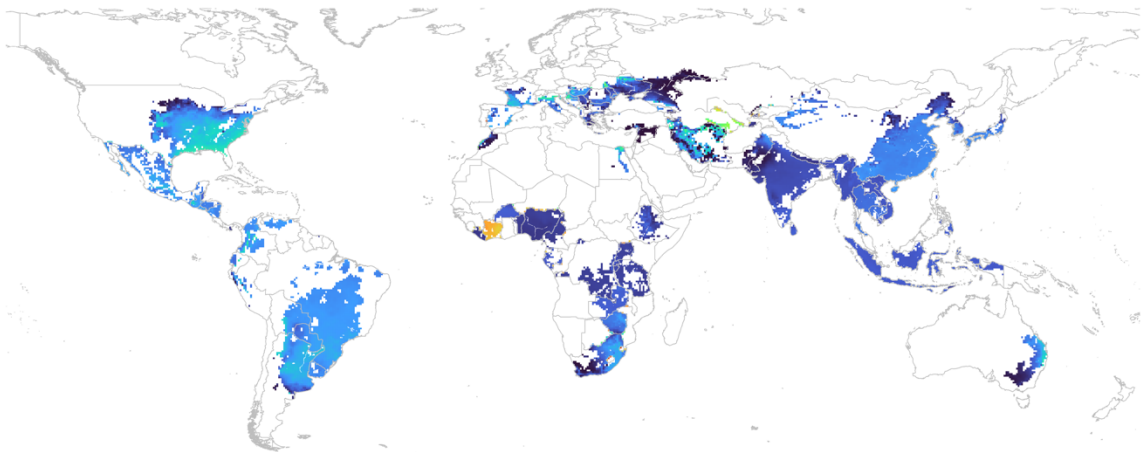
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Fig. S12 Spatial distribution of the mean (1986-2015) simulated yield (a, default; b, improved) and GDHY yield (c) of rice. Units in the legend are t/ha.

(a)



(b)



(c)

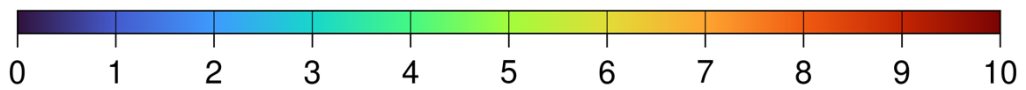
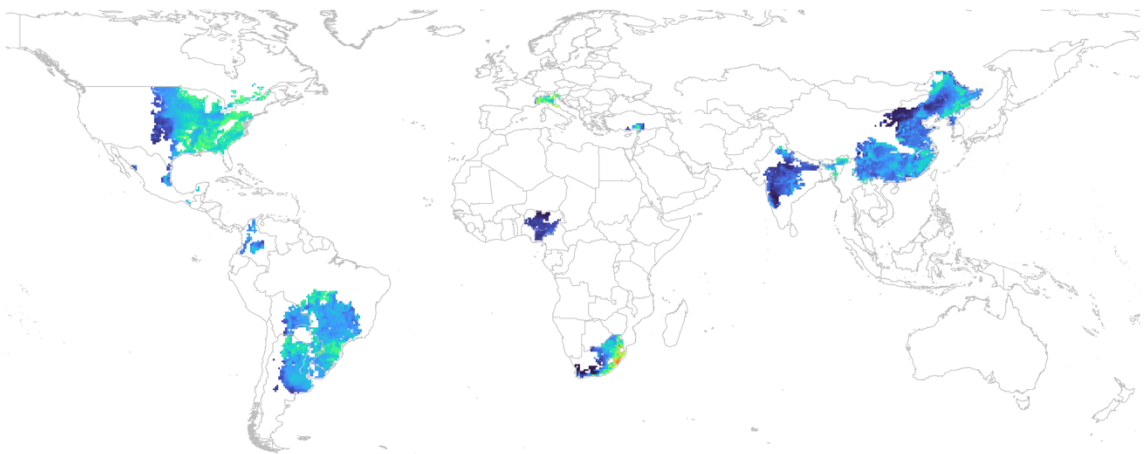


Fig. S13 Spatial distribution of the mean (1986-2015) simulated yield (a, default; b, improved) and GDHY yield (c) of soybean.

45 Units in the legend are t/ha.