

Supplemental Material
**The GGCM Phase II experiment: global gridded crop model
simulations under uniform changes in CO₂, temperature, water,
and nitrogen levels (protocol version 1.0)**

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S1 Cultivation Areas

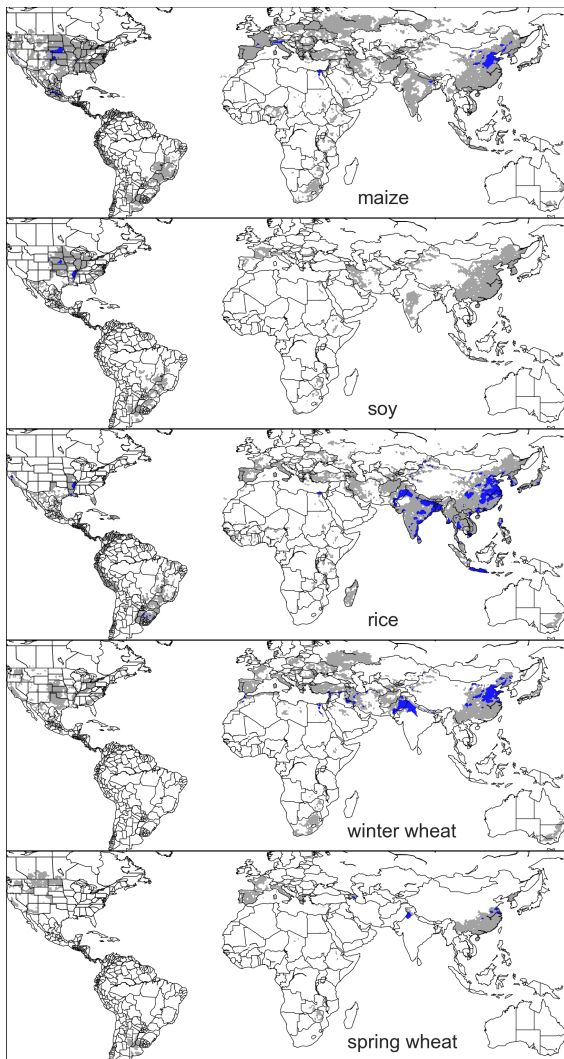


Figure S1: Presently cultivated area for irrigated crops in the real world. The blue contour area indicates grid-cells with more than 20,00 hectares of crop cultivated. The gray contour shows area with more than 10 hectares cultivated. Data from the MIRCA2000 data set for maize, rice, and soy. Winter and spring wheat areas are adapted from MIRCA2000 data and sorted by growing season.

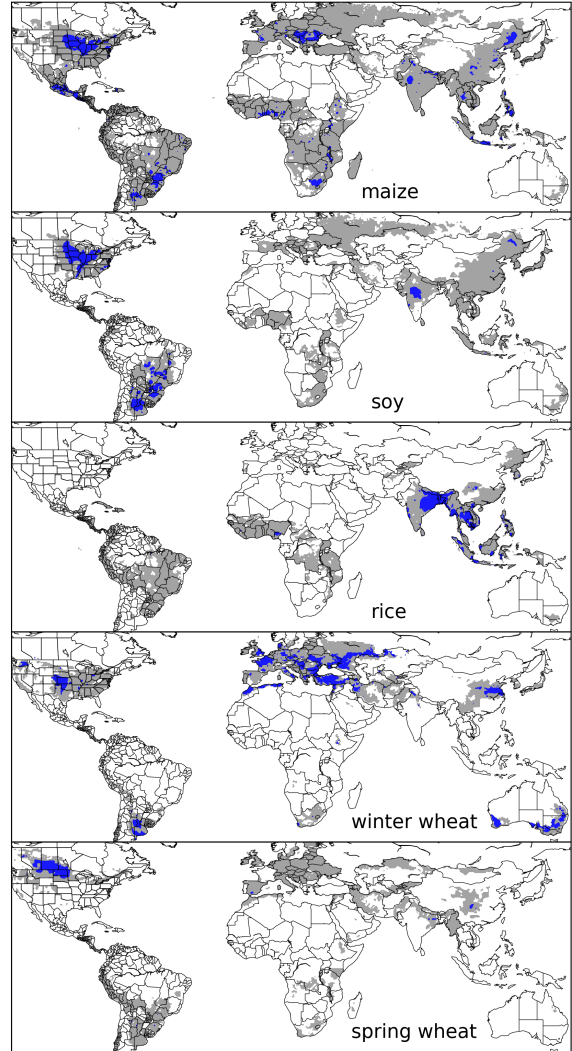


Figure S2: Presently cultivated area for rain fed crops in the real world. Conventions as in Figure S1. This figure repeats manuscript Figure 1 for ease of comparison.

S2 Reanalysis Climate Products

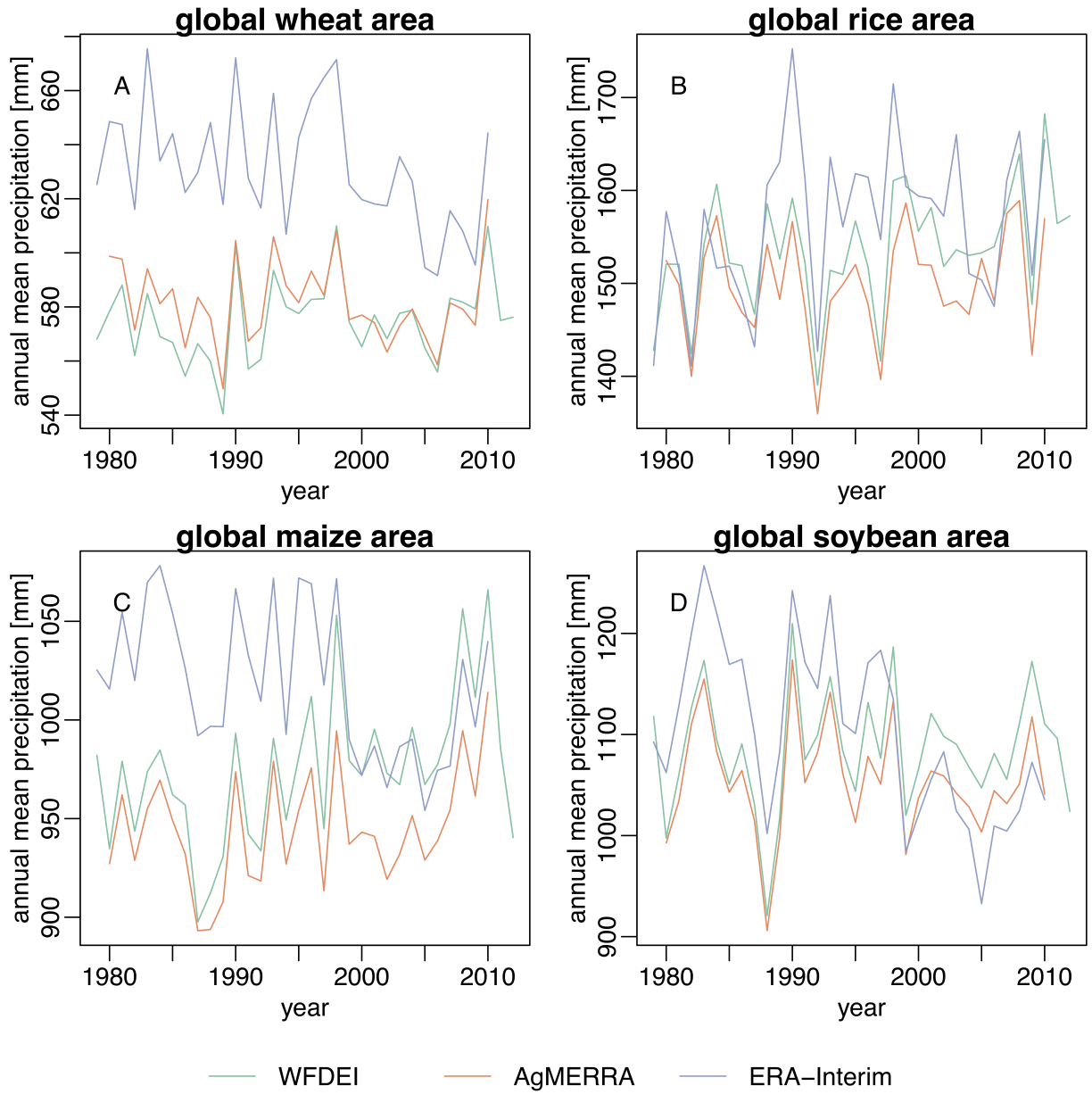


Figure S3: Comparison across the three reanalysis products used in GGCM Phase II. Values are aggregated across cultivation area based on the MIRCA2000 dataset.

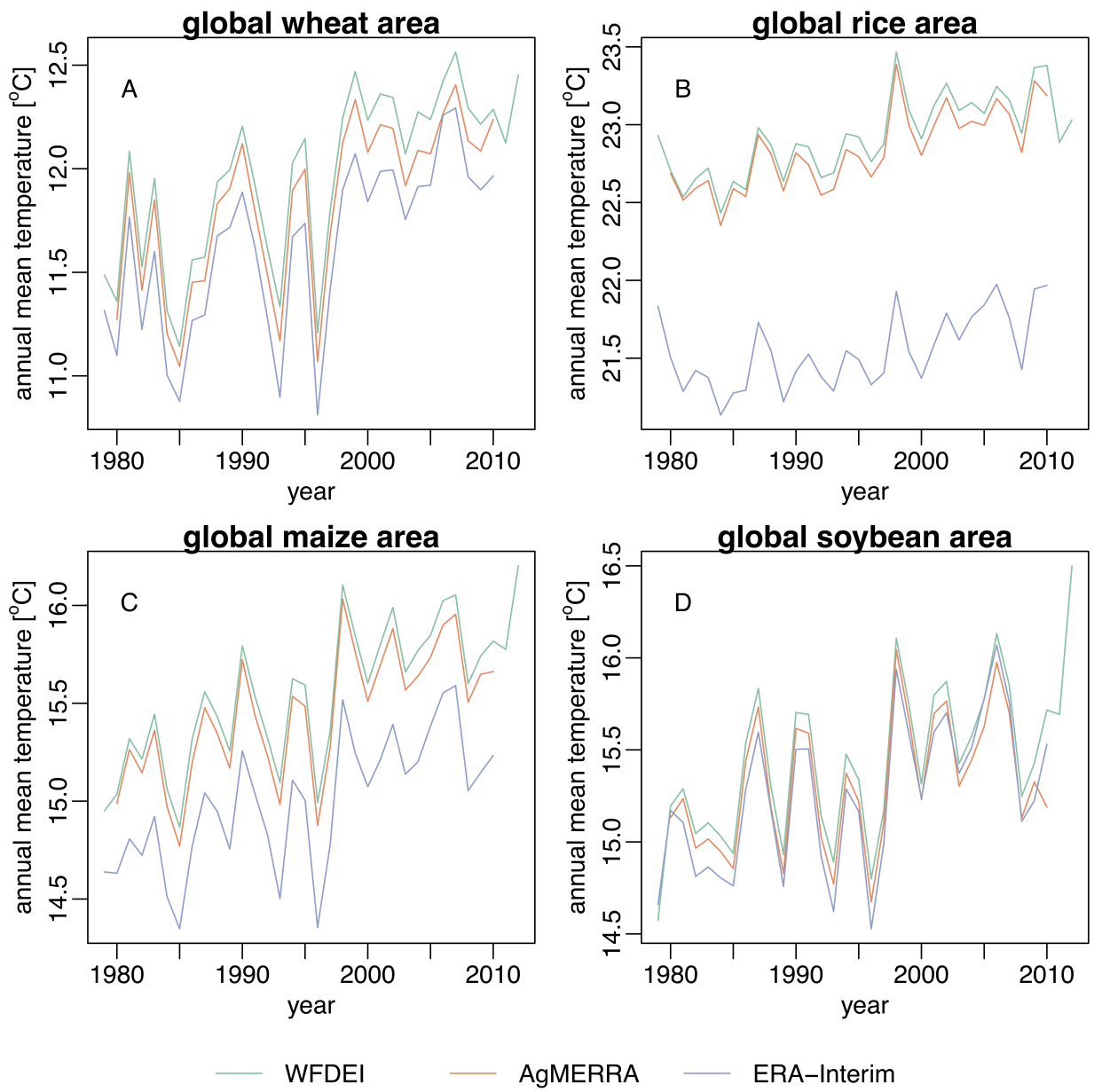


Figure S4: Same as Figure S3 but for temperature.

S3 Results

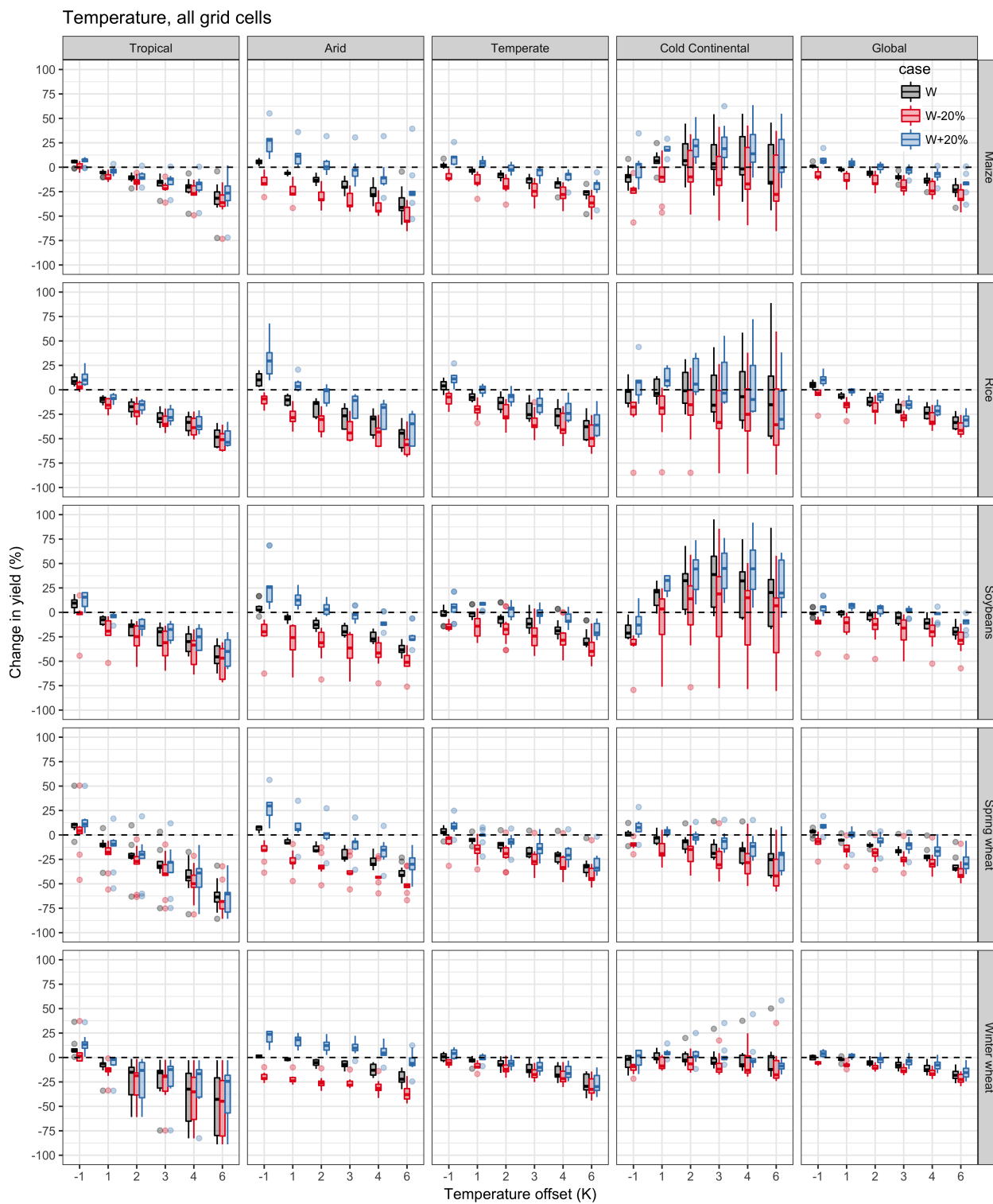


Figure S5: Same as main Figure 5a for all crops.

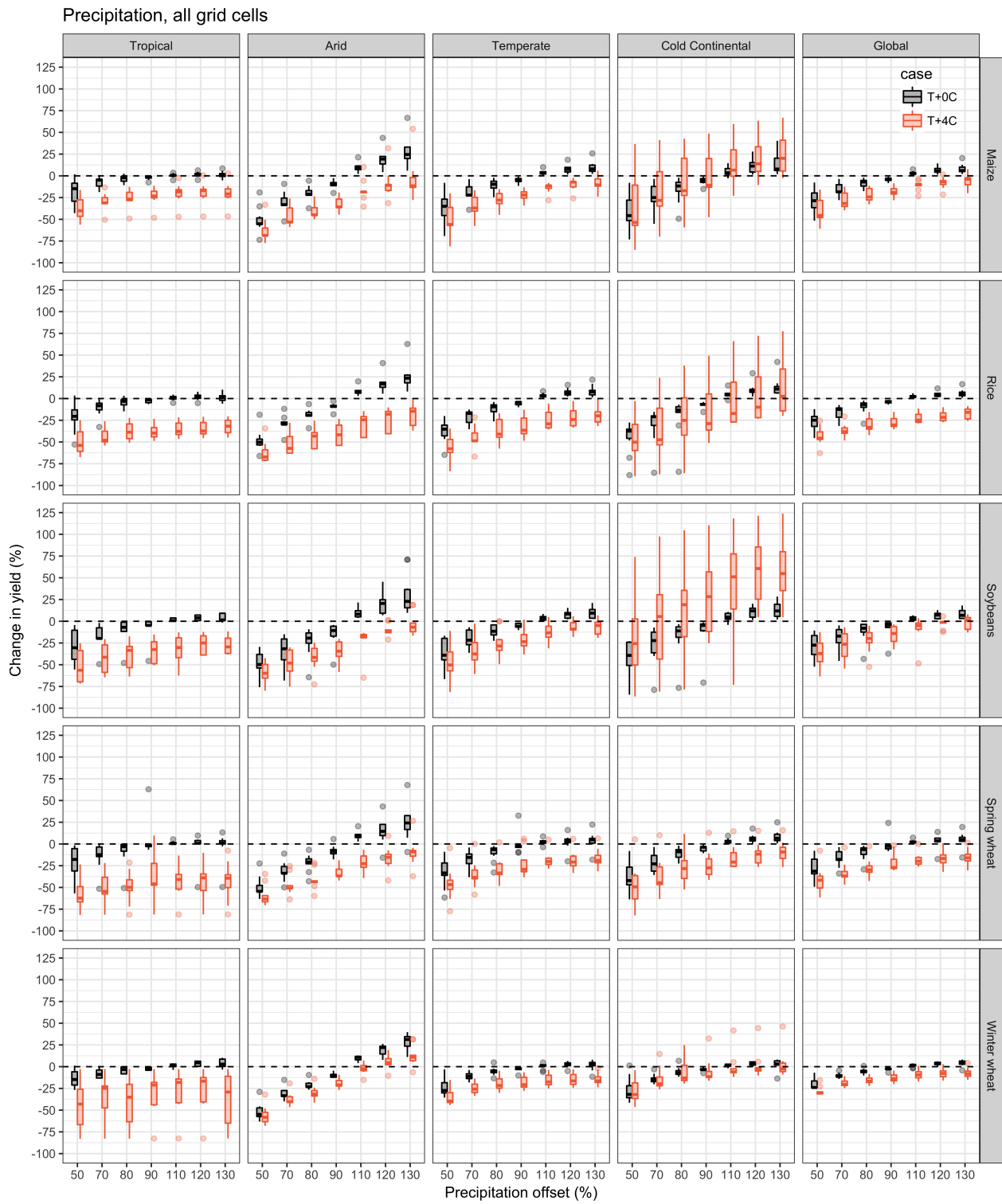


Figure S6: Same as main Figure 5b for all crops.

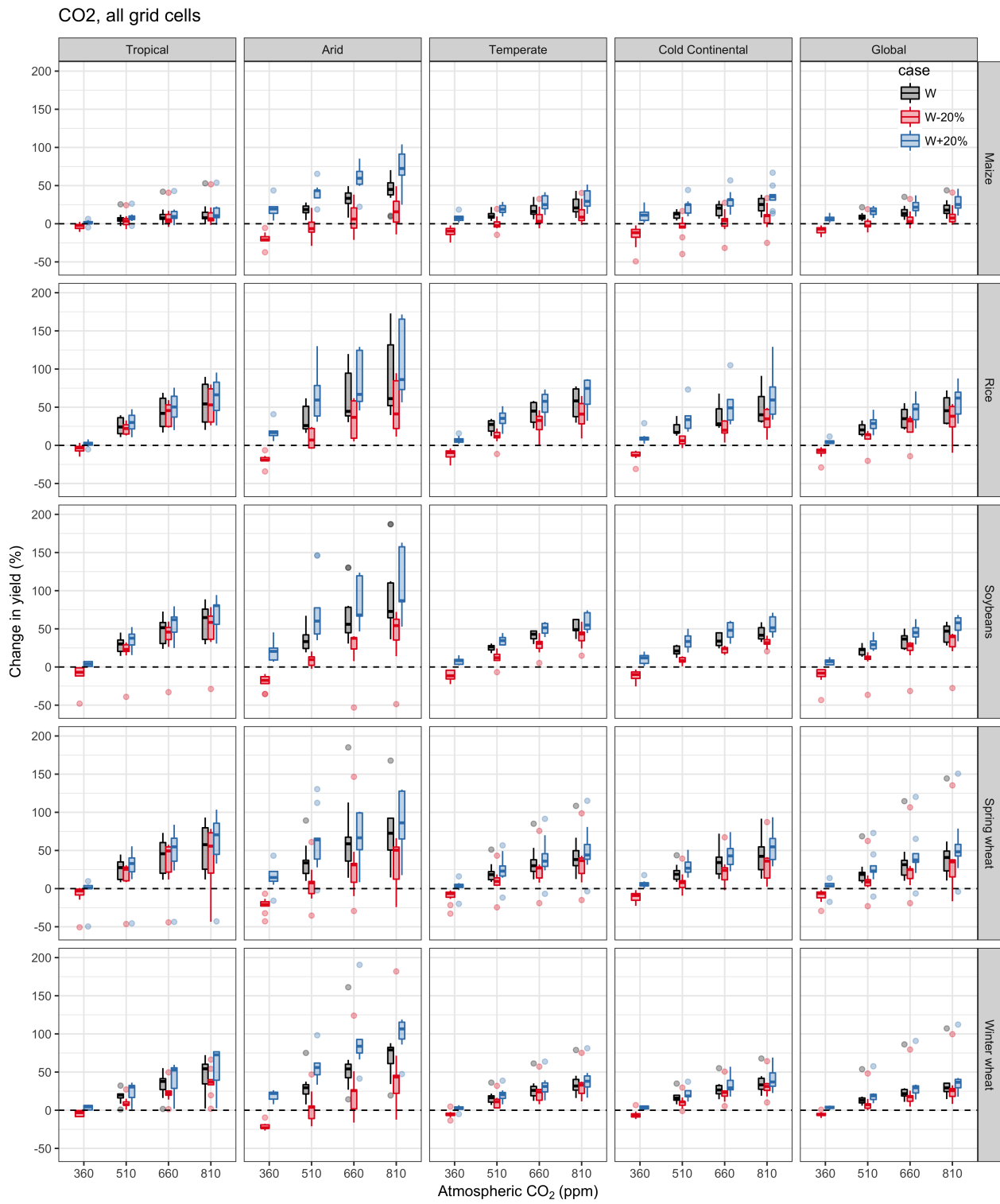


Figure S7: Same as main Figure 6a for all crops.

Temperature, all gridcells



Figure S8: Same as main Figure 6b for all crops.

Temperature-Irrigation, all grid cells

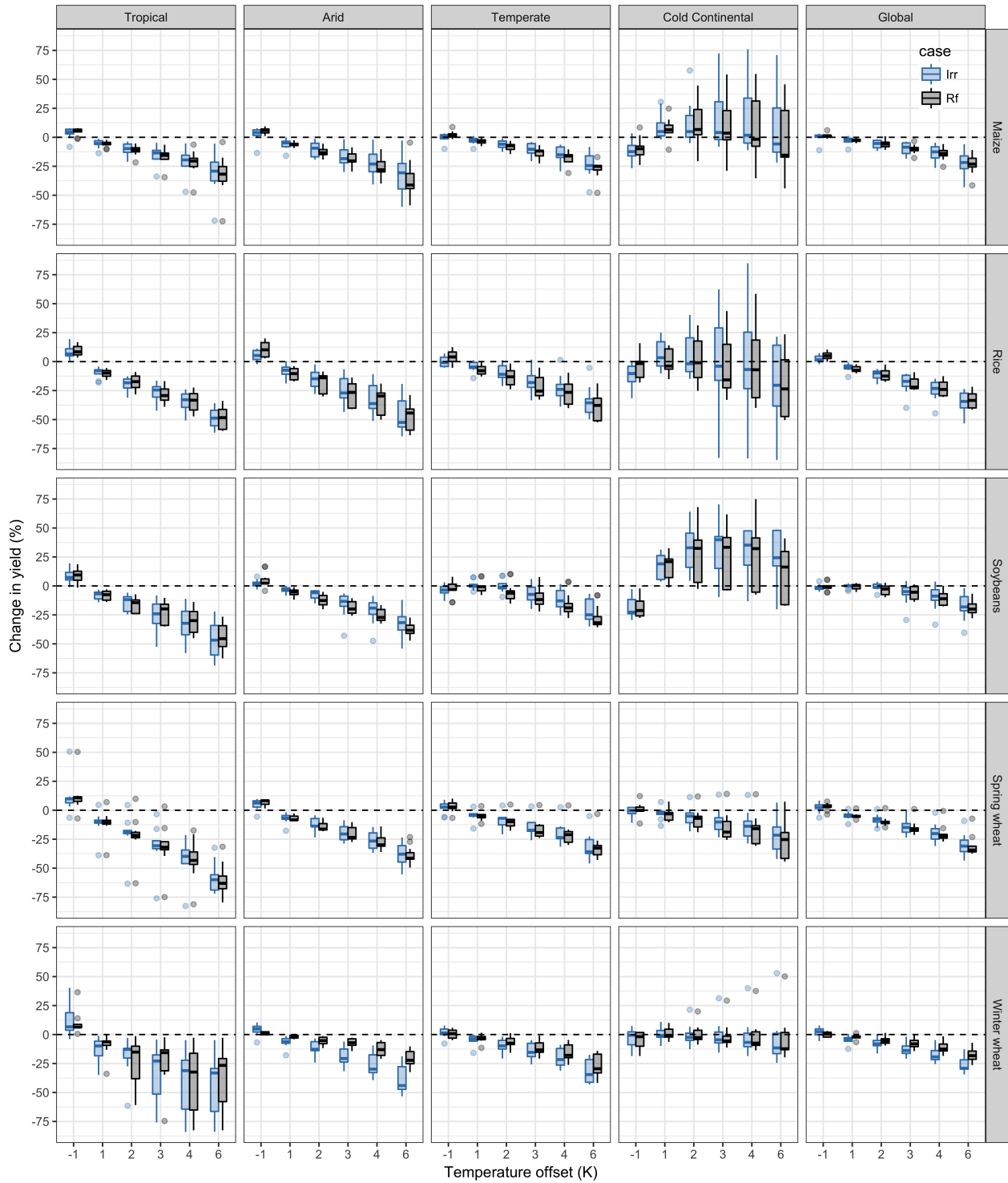


Figure S9: Same as main Figure 5a for all crops. Irrigated crops compared to rainfed. Note that yield change for irrigated crops is from the irrigated baseline, which is typically higher than rainfed.

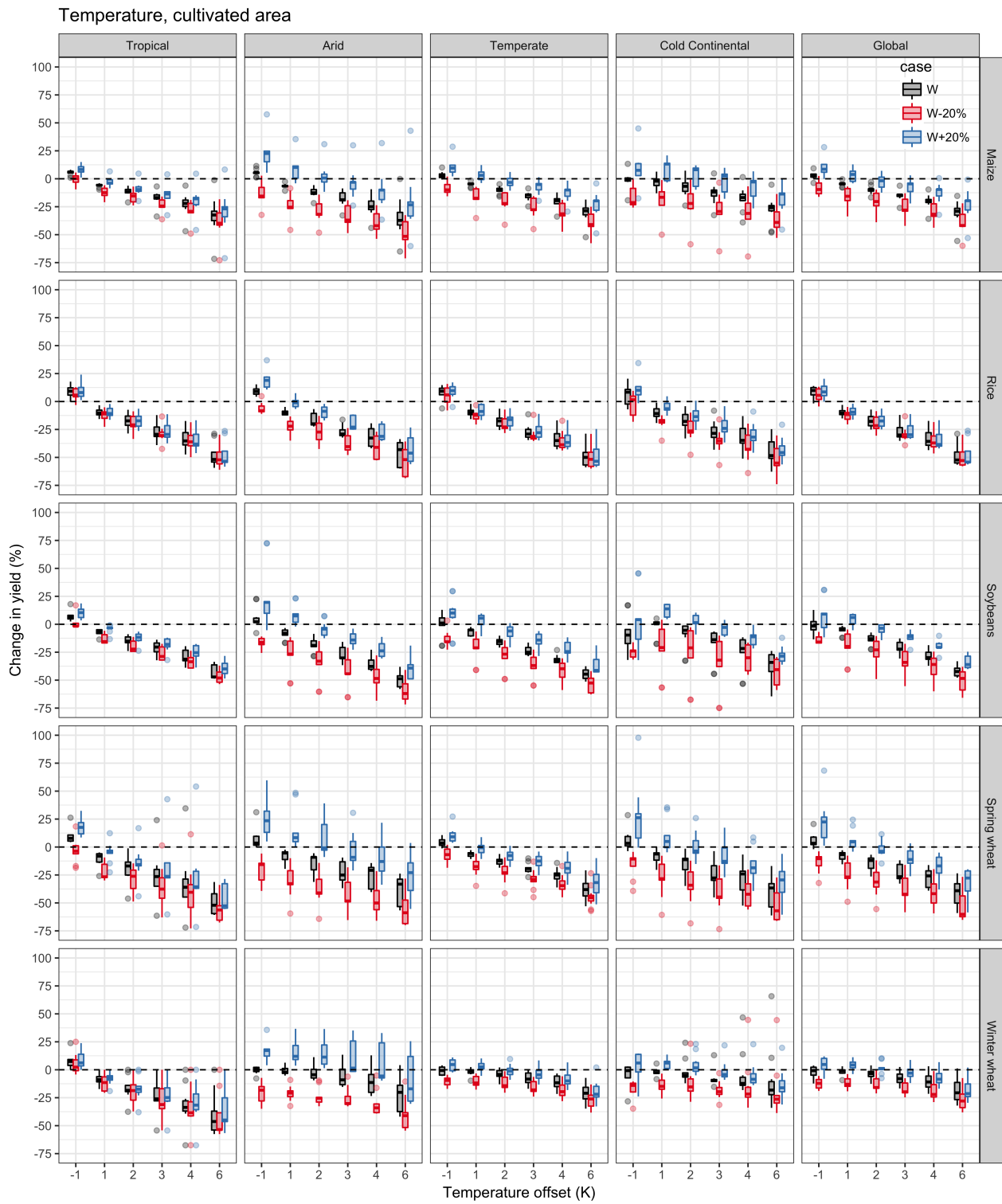


Figure S10: Same as main Figure 5a for all crops. Only over cultivated area.

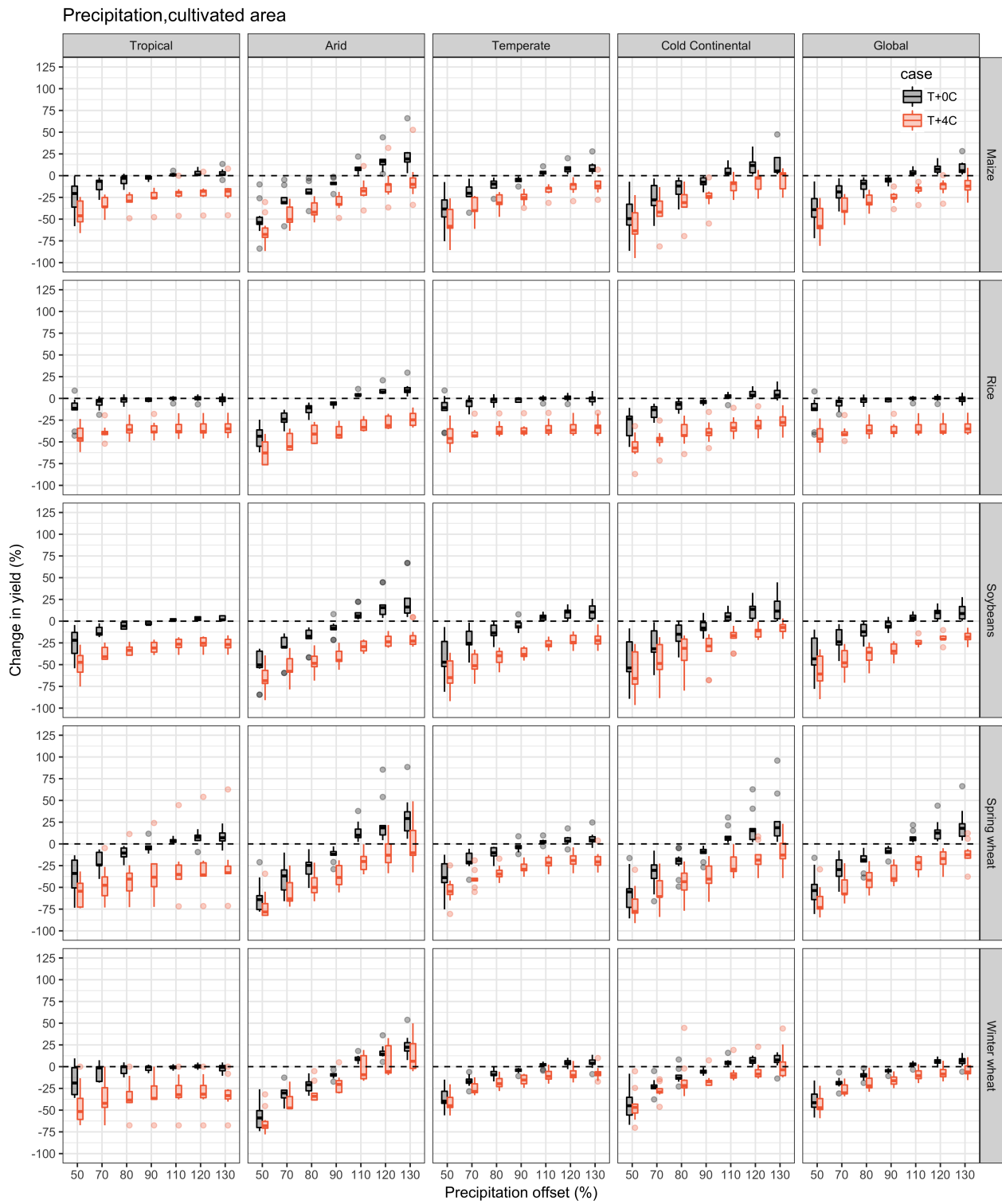


Figure S11: Same as main Figure 5b for all crops. Only over cultivated area.

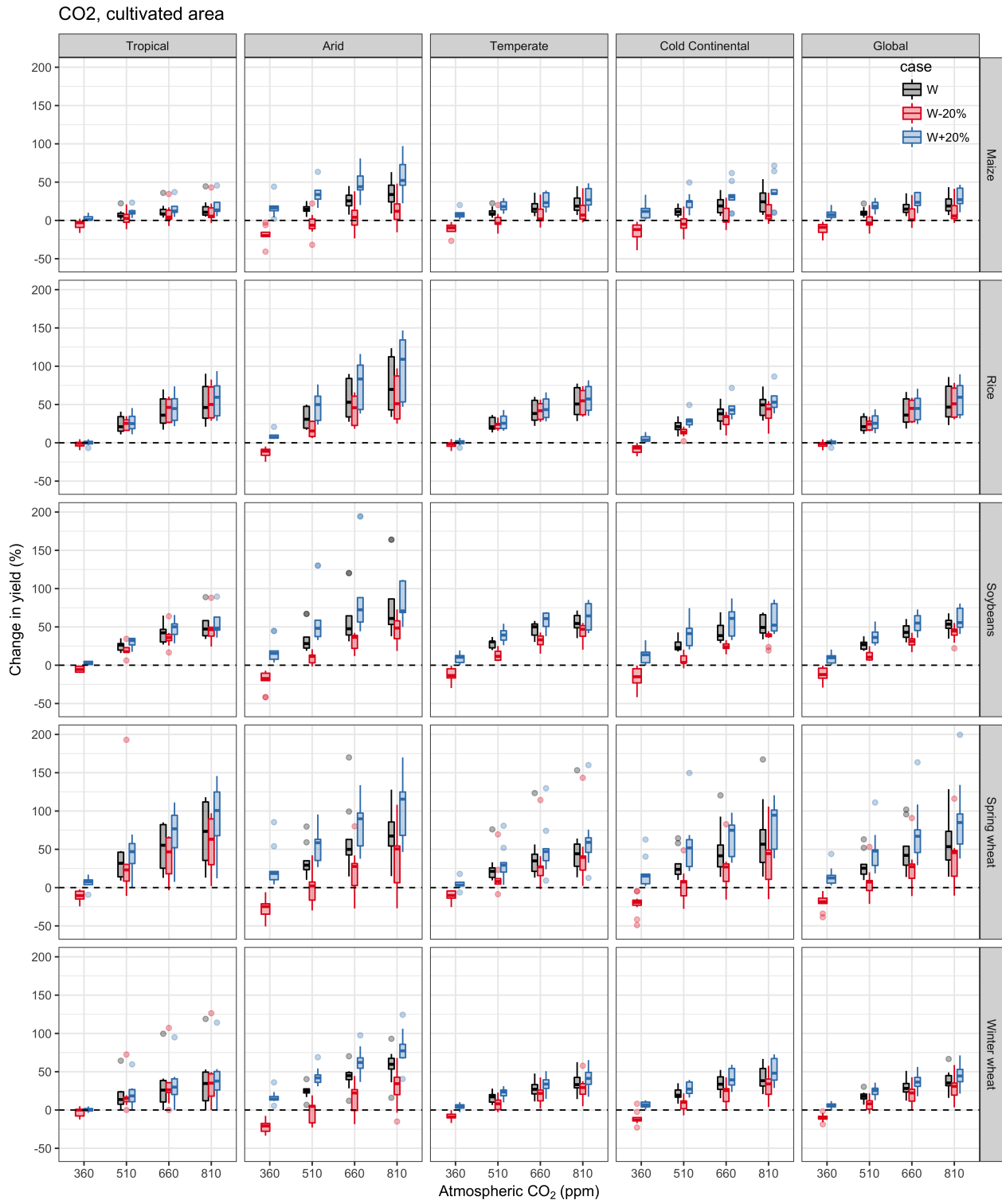


Figure S12: Same as main Figure 6a for all crops. Only over cultivated area.

Temperature, cultivated area



Figure S13: Same as main Figure 6b for all crops. Only over cultivated area.