



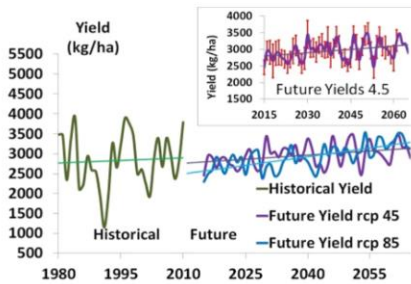
Simulations of regional yields and GHG emissions

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Table 1. Baseline crop rotation for each agro-ecological zone.

Rainfall Zone	Tillage intensity	Crop rotation
Low	CT	WW - SF
Intermediate	CT	WW - SW - SF
High	CT	WW - SW - SP
Irrigated	CT	P - WW - C

WW = winter wheat; SW = spring wheat; SP = spring peas; P = potato; C = grain corn; SF = summer fallow

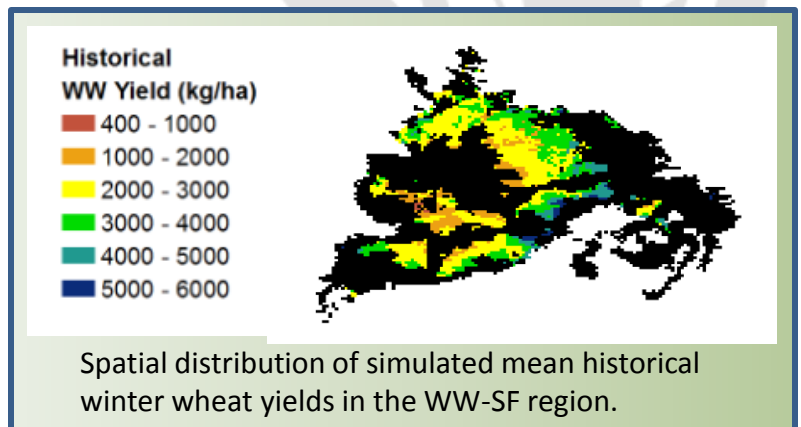


	ΔSOC	N ₂ O	GHG Emission	WW Yield
	(Mg CO ₂ e/ha/year)			(kg/ha)
Historical	-0.20	0.09	0.29	2834.67
2030				
Mean RCP 45	-0.246	0.082	0.329	2885.6
CV RCP 45	0.369	0.091	0.281	0.045
Mean RCP 85	-0.288	0.079	0.367	2760.2
CV RCP 85	0.418	0.103	0.338	0.063
2050				
Mean RCP 45	-0.264	0.082	0.346	3033.0
CV RCP 45	0.375	0.094	0.294	0.045
Mean RCP 85	-0.294	0.084	0.378	3067.4
CV RCP 85	0.373	0.145	0.303	0.073

Pictures shown, from top to bottom, are:

- 1) Baseline rotations.
- 2) WW yield trends. Error bars are standard deviation of 12 GCMs.
- 3) Yield and GHG emission for historical and two future periods.

A regional assessment of baseline and future yields and GHG emissions is being conducted using the CropSyst simulation model and 4x4 km gridded weather data. Future weather is projected using 12 general circulation models (GCMs) and two representative concentration pathways of future atmospheric CO₂ (rcp 4.5 and rcp 8.5). The study region is divided in 4 agro-ecological zones (AEZ): low, intermediate and high precipitation zones and irrigated zone. A typical conventional tillage (CT) cropping system in each AEZ will be evaluated as baseline (Table 1). Alternative cropping systems will be considered later in the project. The results presented are for the low rainfall zone, with projections for the periods 2015-44 (2030s) and 2035-64 (2050s). Overall, the mean of all GCMs indicates a trend to a small increase in winter wheat yields by half of the century, but with large variability among GCMs. Year-to-year yield variations appear smaller with projected than historical weather, mainly due to “averaging smoothing” for the latter, but this needs further evaluation. GHG emissions will also increase slightly due to enhanced soil carbon loss (N₂O losses decreasing slightly due to some increase in crop N uptake).



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