



Global Yield
Gap Atlas

GYGA technology extrapolation domains (TEDs)

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Why TEDs?

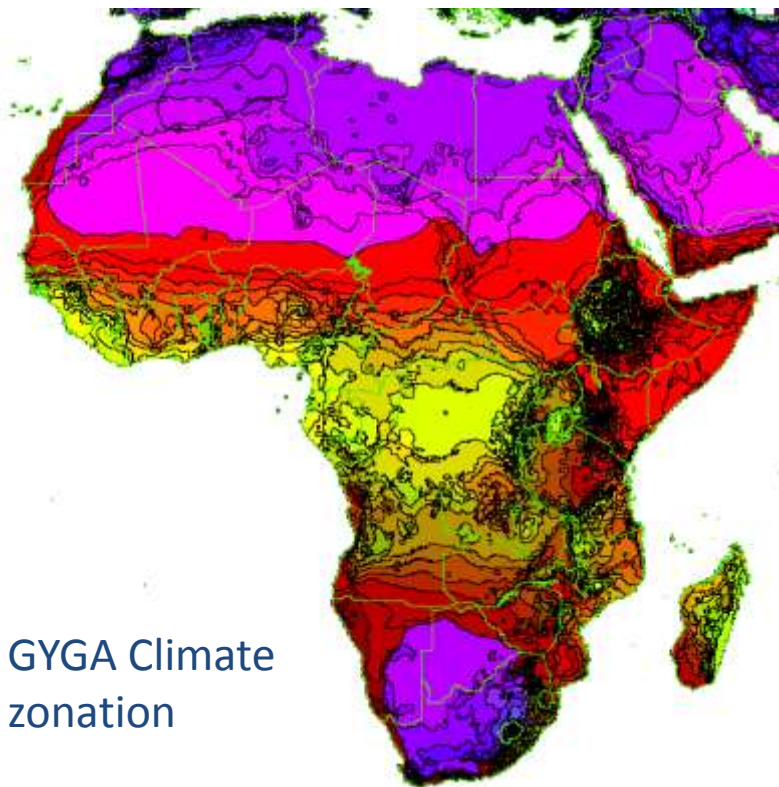
- Robust spatial framework for targeting:
 - Options for sustainable intensification
 - ‘Taking agronomy to scale’
 - New experimentation
 - ‘Biggest bang for the buck’
- Hierarchical zonation scheme, with the smallest spatial unit a unique combination of **soil** type and **climate**, with added information on yield gap assessment (e.g. Yw with CV)

Principles

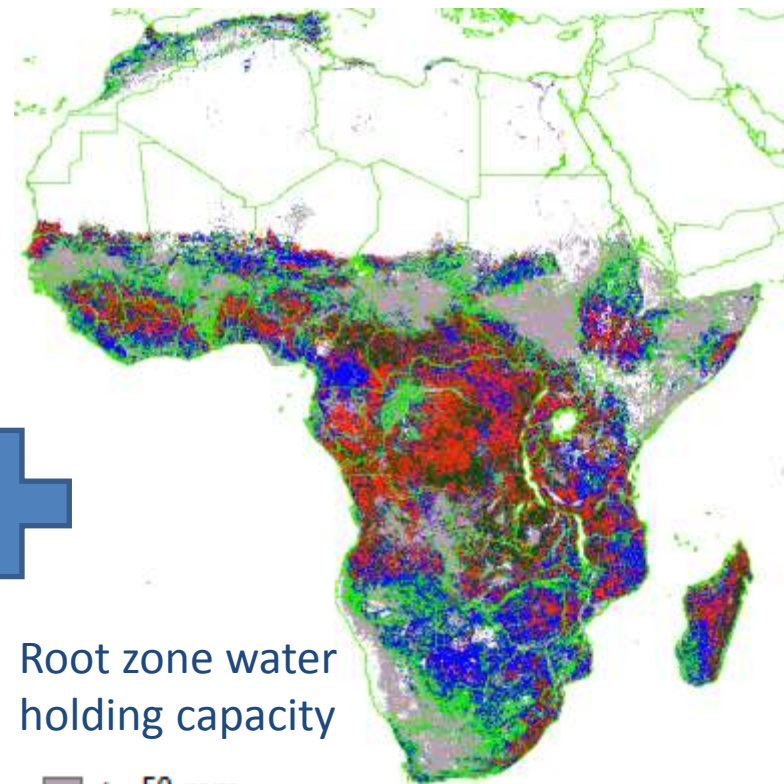
- Global with initial focus on SSA
- Generic (not crop specific)
- Targeting rainfed cropping systems
- Focus on soil water storage
- Leveraging on GYGA-CZ and AfSIS soil data



Construction of TEDs



GYGA Climate zonation

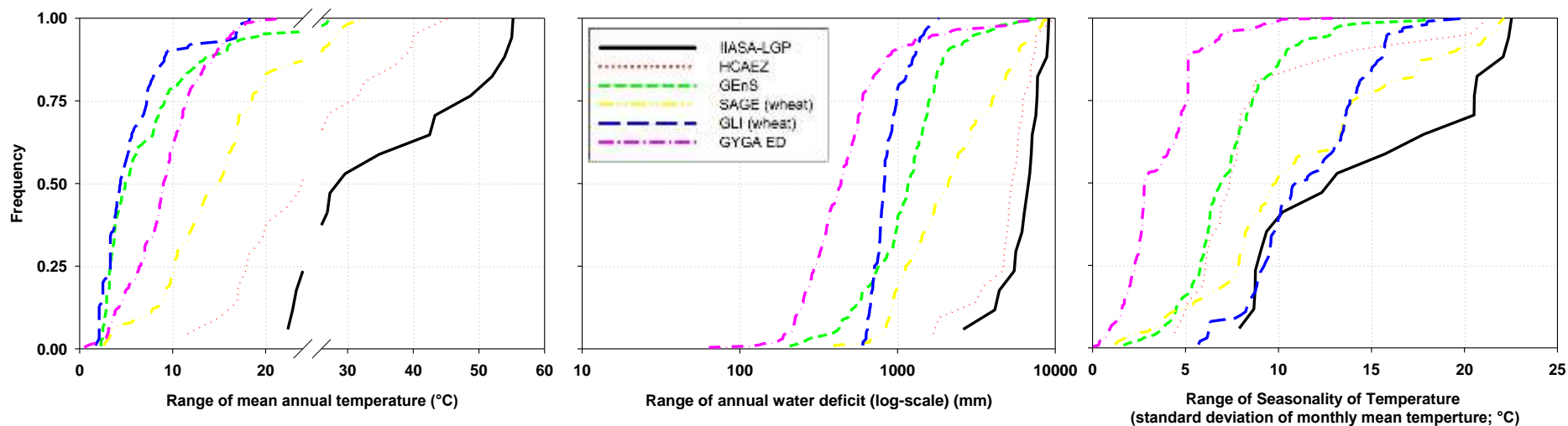


Root zone water holding capacity



Evaluation of GYGA climate zone scheme

GYGA climate zone scheme is generic (i.e., not crop-specific), has a reasonable # of climate zones and, relative to previous schemes, it exhibits smaller climate variation within a zone



Source: Van Wart J, van Bussel LGJ, Wolf J, Licker R, Grassini P, Nelson A, Boogaard H, Gerber J, Mueller ND, Claessens L, van Ittersum MK, Cassman KG. 2013. Use of agro-climatic zones to upscale simulated crop yield potential. *Field Crops Res.* 143:44-55

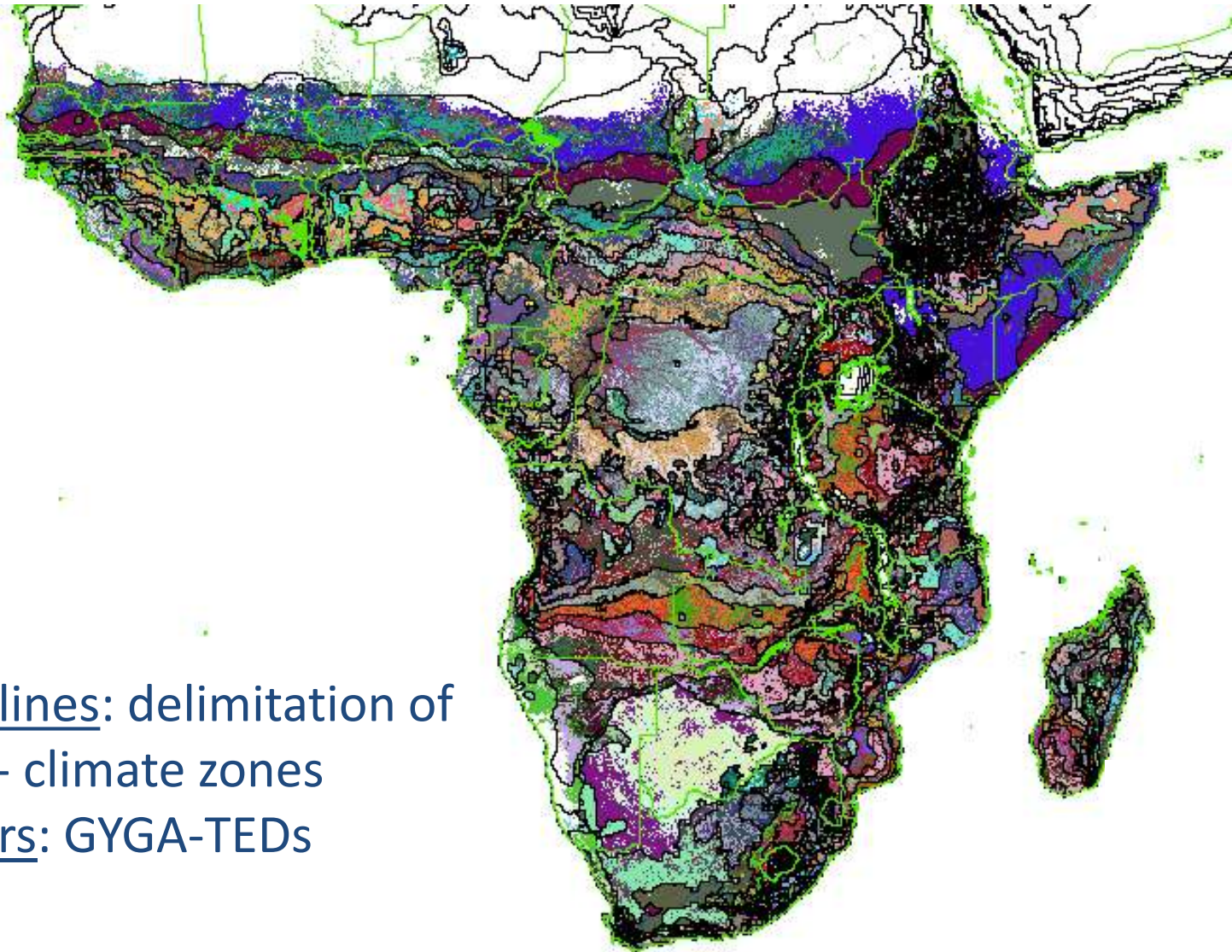
Construction of TEDs

- Sum of 3 GYGA-CZ variables and RZWHC class (9)

• value = 101001 =	GYGA-RZWHC value	100000
	GYGA-CZ Value GDD	1000 +
	GYGA-CZ Value AI	0 +
	GYGA-CZ Value Temperature seasonality	1
• value = 806801 =	GYGA-RZWHC value	800000
	GYGA-CZ Value GDD	6000 +
	GYGA-CZ Value AI	800 +
	GYGA-CZ Value Temperature seasonality	1
• value = 1010402 =	GYGA-RZWHC value	1000000
	GYGA-CZ Value GDD	10000 +
	GYGA-CZ Value AI	400 +
	GYGA-CZ Value Temperature seasonality	2



GYGA technology extrapolation domains

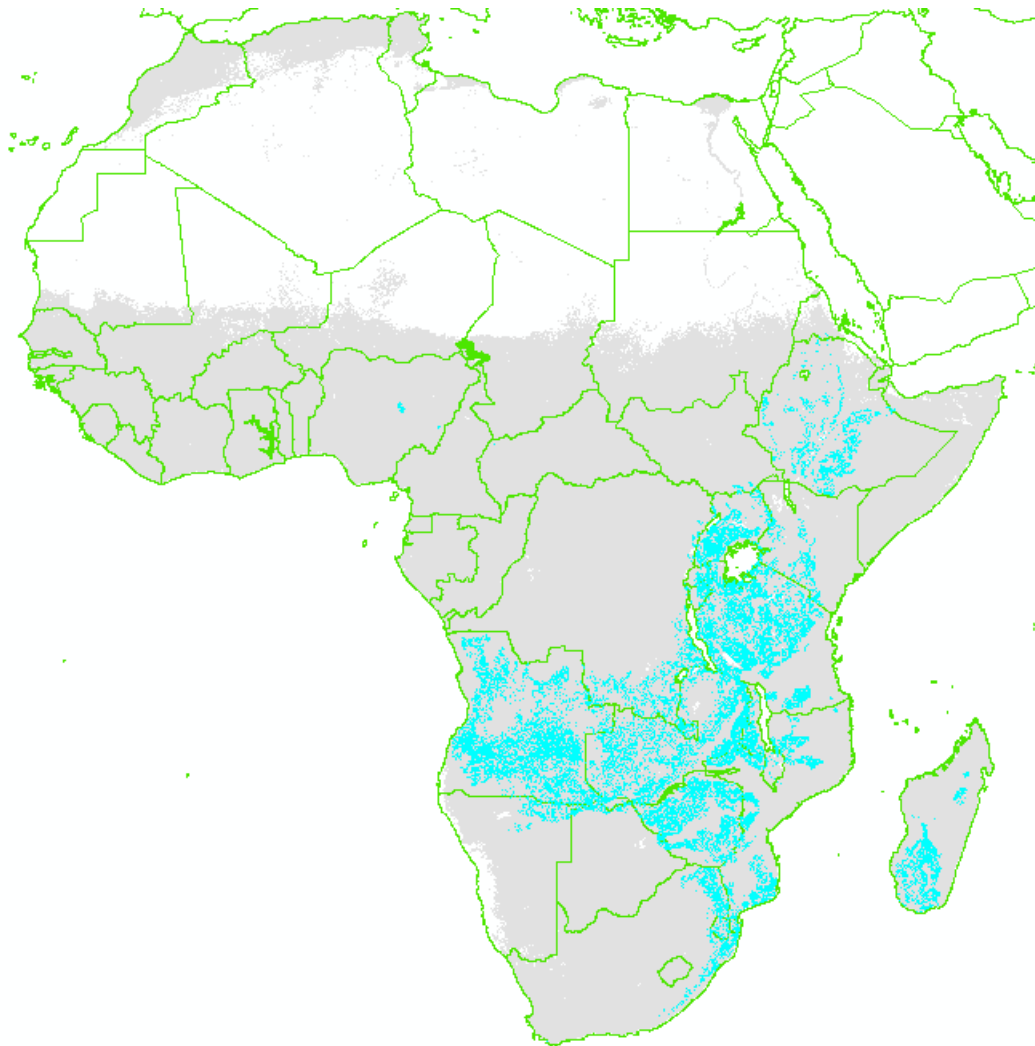


Black lines: delimitation of
GYGA- climate zones
Colours: GYGA-TEDs

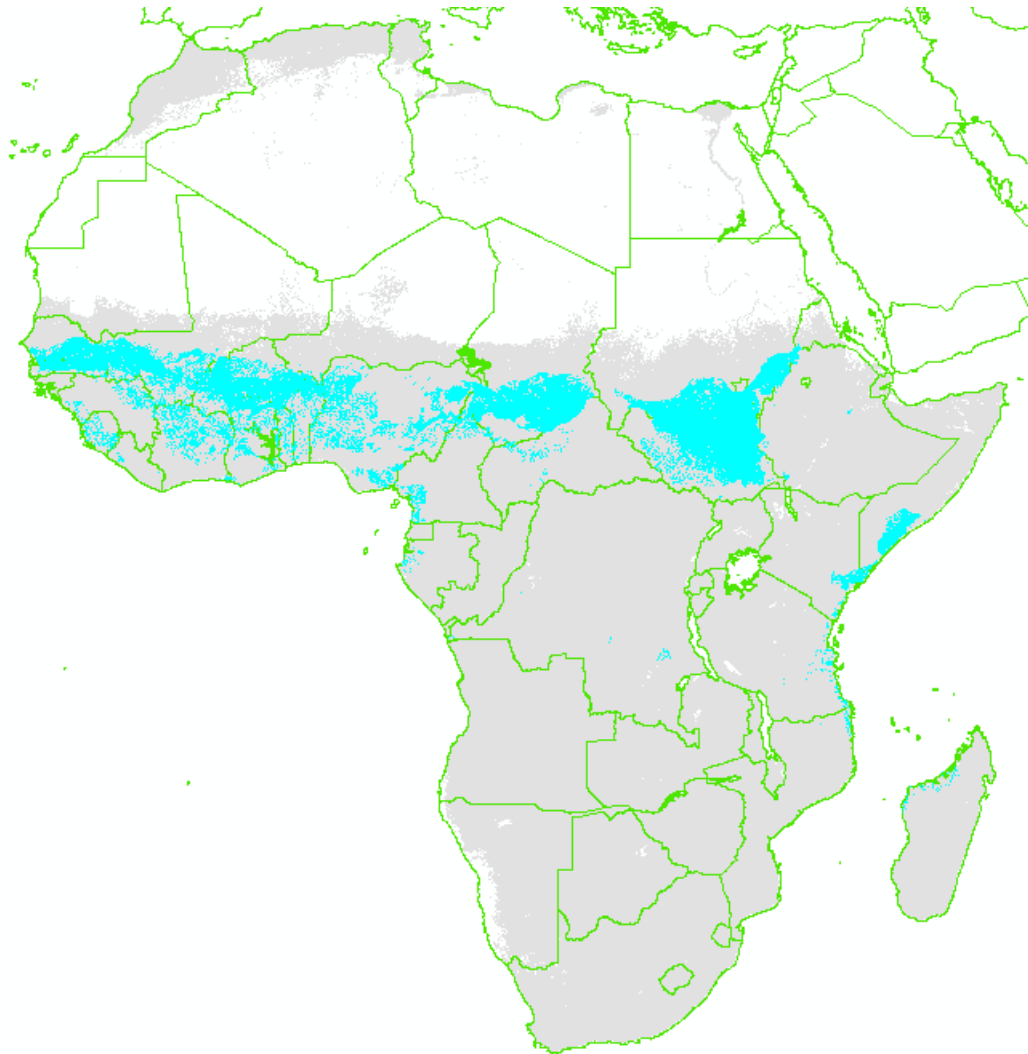
Dominant TEDs

- Per crop dominant TEDs have been determined based on crop-specific harvested area in GYGA countries from SPAM05
- Separate analyses for East and West Africa

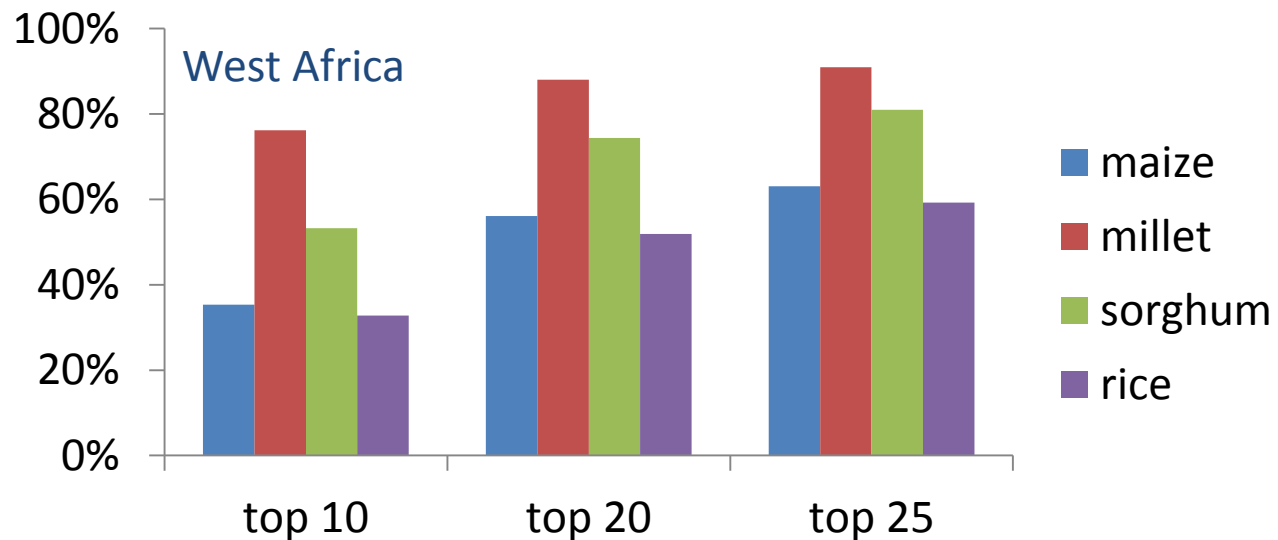
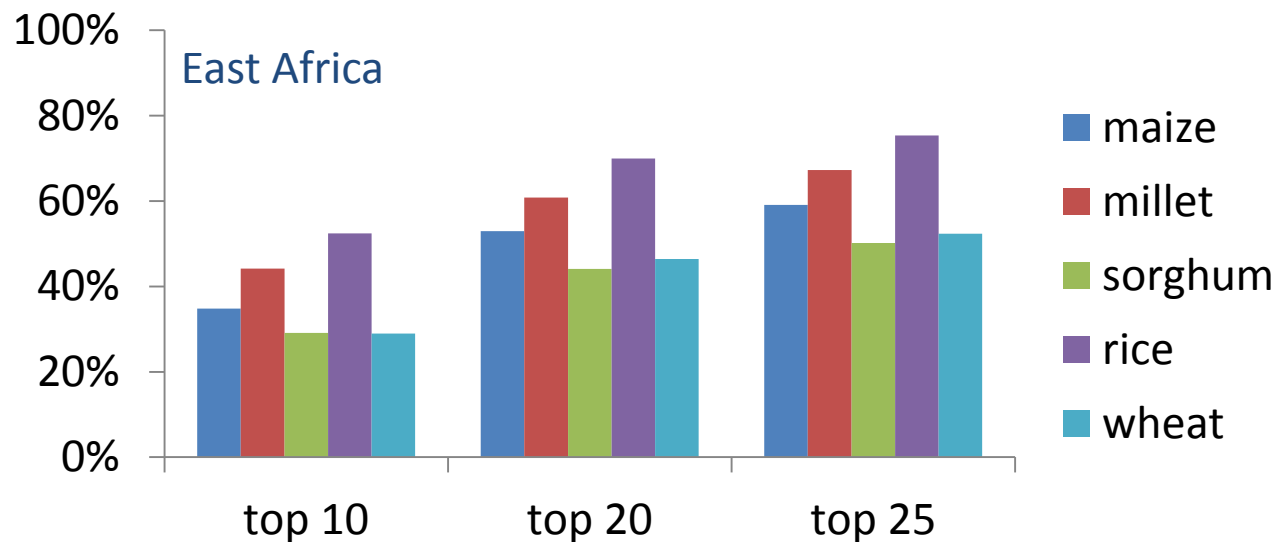
Locations of 10 dominant GYGA-TEDs in East Africa



Locations of 10 dominant GYGA-TEDs in West Africa



Crop area coverage dominant TEDs



Discussion and possible improvements

- Climate x Soil x Cropping system (and Yg)
- Overlay with additional information:
 - Proximity to roads and markets
 - Access to inputs (seeds, fertilizer,...)
 - Socio-economic information from farm surveys (farm size, labour, input use, off-farm income,....)





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Thanks for your attention!
www.yieldgap.org

References

- Grassini, P., L.G.J. Van Bussel, J. van Wart, J. Wolf, L. Claessens, H. Yang, H. Boogaard, H. de Groot, M.K. van Ittersum and K.G. Cassman. 2015. How good is good enough? Data requirements for reliable crop yield simulations and yield-gap analysis. *Field Crops Research*. 177, 49-63
- Van Bussel, L.G.J., P. Grassini, J. van Wart, J. Wolf, L. Claessens, H. Yang, H. Boogaard, H. de Groot, K. Saito, K.G. Cassman and M.K. van Ittersum. 2015. From field to atlas: Upscaling of location-specific yield gap estimates. *Field Crops Research*. 177, 98-108.
- Van Ittersum, M.K., Rabbinge, R., 1997. Concepts in production ecology for analysis and quantification of agricultural input-output combinations. *Field Crops Res.* 52, 197–208.
- Van Wart J, van Bussel LGJ, Wolf J, Licker R, Grassini P, Nelson A, Boogaard H, Gerber J, Mueller ND, Claessens L, van Ittersum MK, Cassman KG. 2013. Use of agro-climatic zones to upscale simulated crop yield potential. *Field Crops Res.* 143:44-55