Biofortified maize in Zimbabwe: nutritional quality depending on field position and crop management

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SOILS: WHERE FOOD BEGINS

Global Symposium on Soils for Nutrition | 26-29 July 2022

GLOBAL SOIL PARTNERSHIP

Project overview (2020 – 2023)

ROTHAMSTED RESEARCH

CIMMYT International Maize and Wheat Improvement Center

WP1: Effects of agronomic management on novel, biofortified maize lines on station.

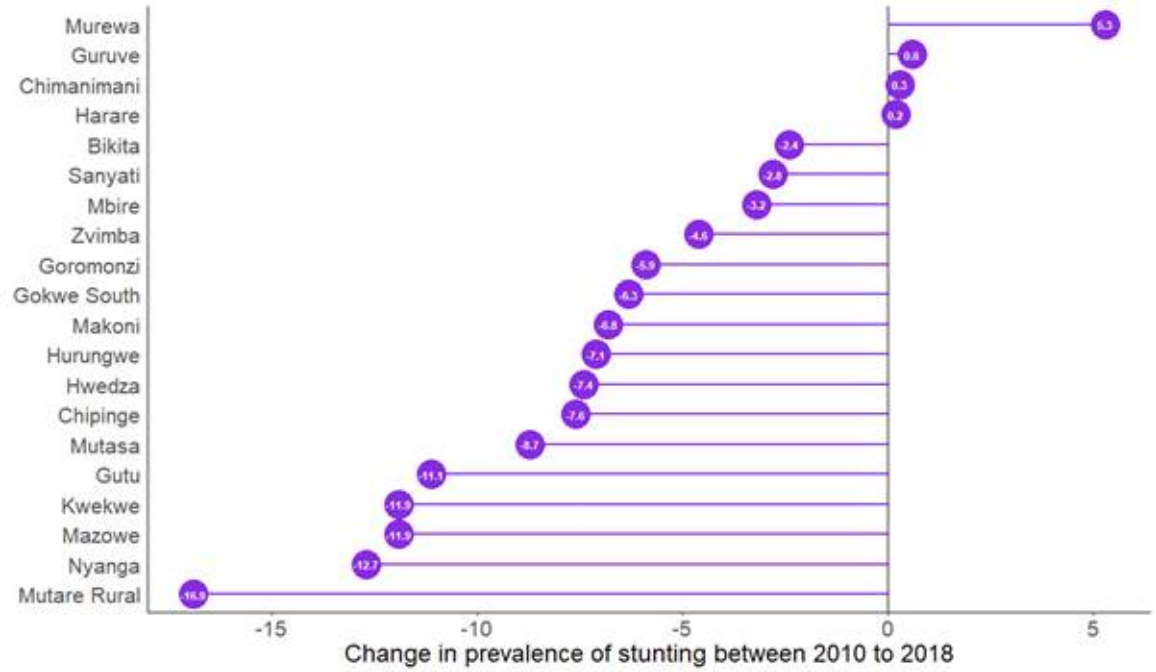
WP2. Testing PVA and QPM varieties at the farm-scale.

WP3. Closing the nutrient gap at the national level.

WP4. Upscaling and dissemination

Testing the effectiveness of agronomic biofortification at the farm-scale.

- Survey of 300 farms and selection of 60 farms for two seasons in Murewa.
- Each farm hosted a trial replicated in a fertile field of the farm (homefield) and in one of the least productive field of the farm (outfield).
- Control (Pan53), PVA (ZS244/500), QPM (MQ623)



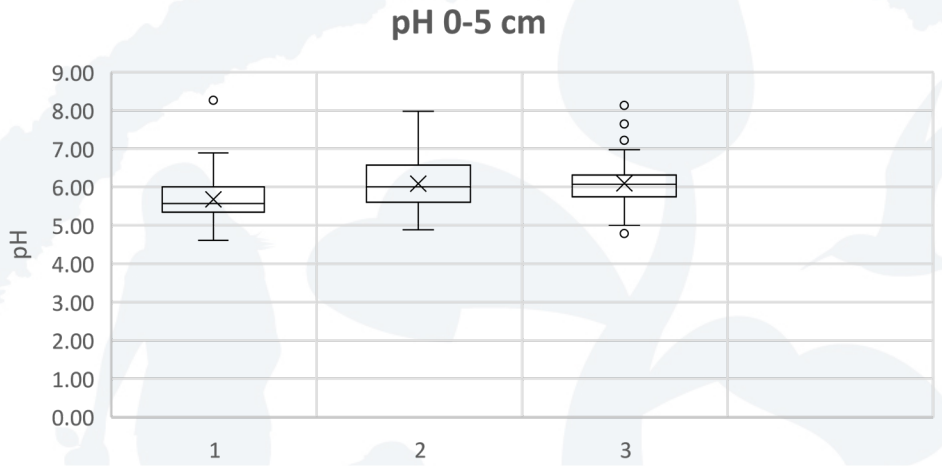
Ash as fertilizer and biochar in homefields

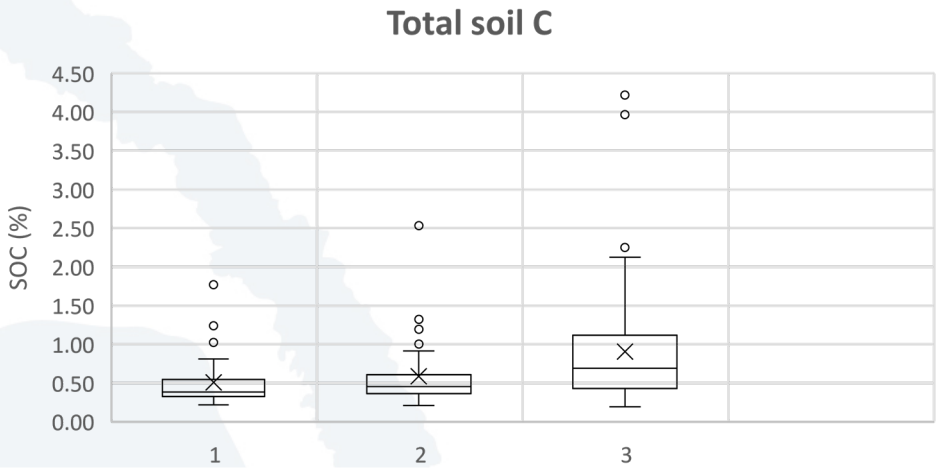
FYM access only for few farmers

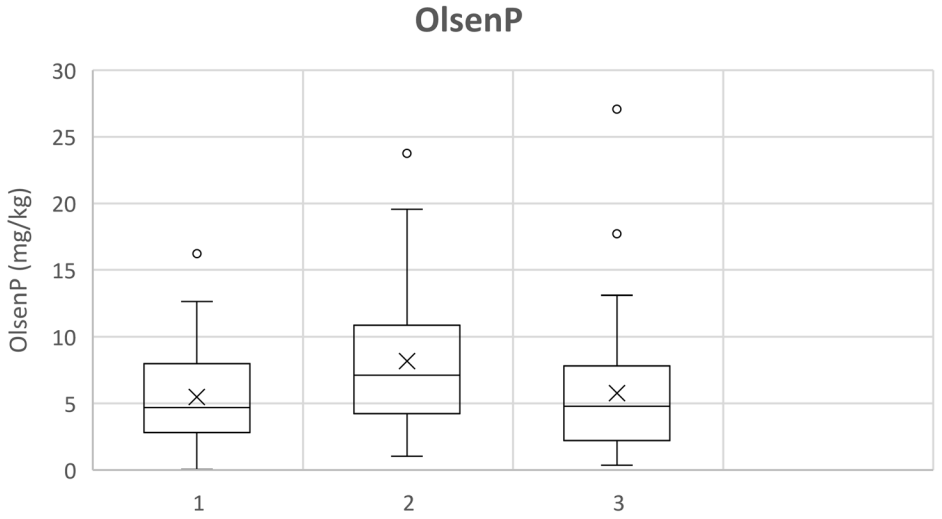
Mulch from weeds and grass

Farmers management options mostly limited to home fields

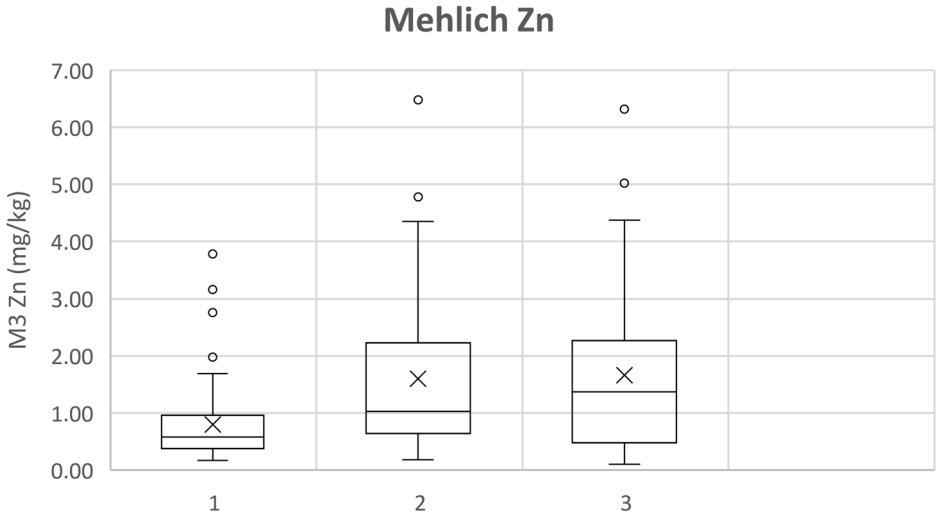
Selected soil results for Out and Home fields, and Virgin land







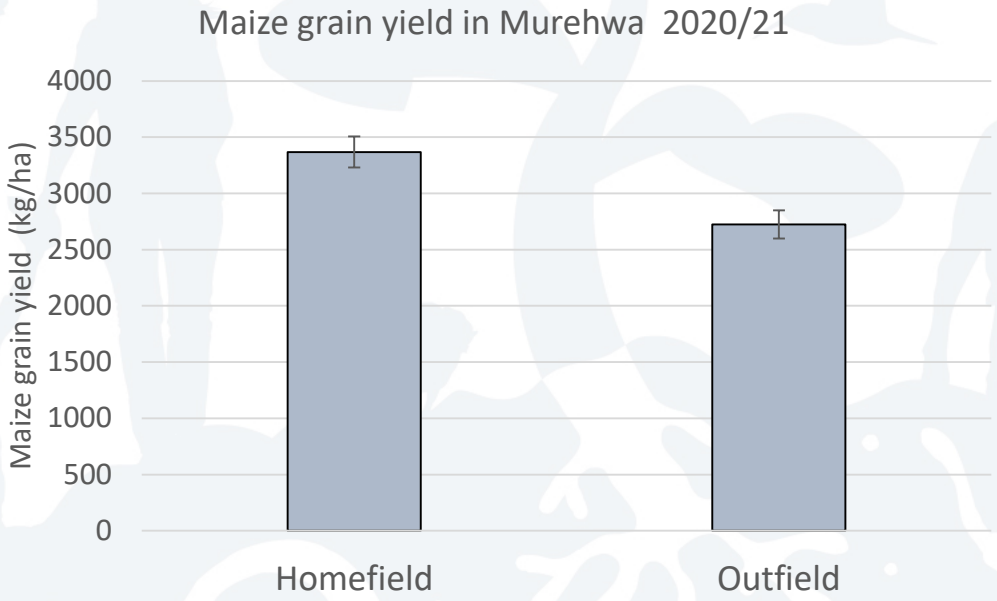
Out (1), Home (2) and virgin (3) fields

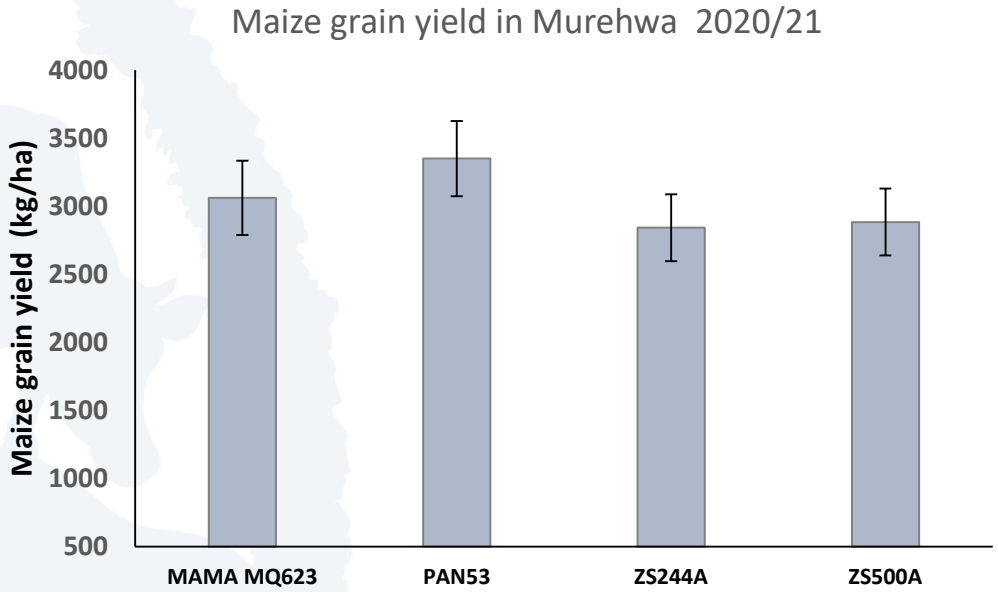


Out (1), Home (2) and virgin (3) fields

- There is a trend of slightly better soil fertility on home fields

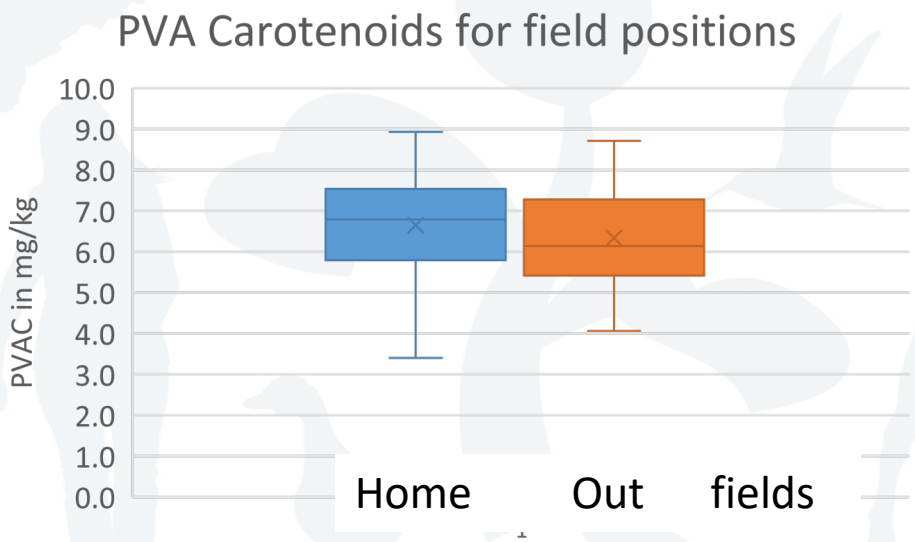
Selected grain yield results from the on-farm trials

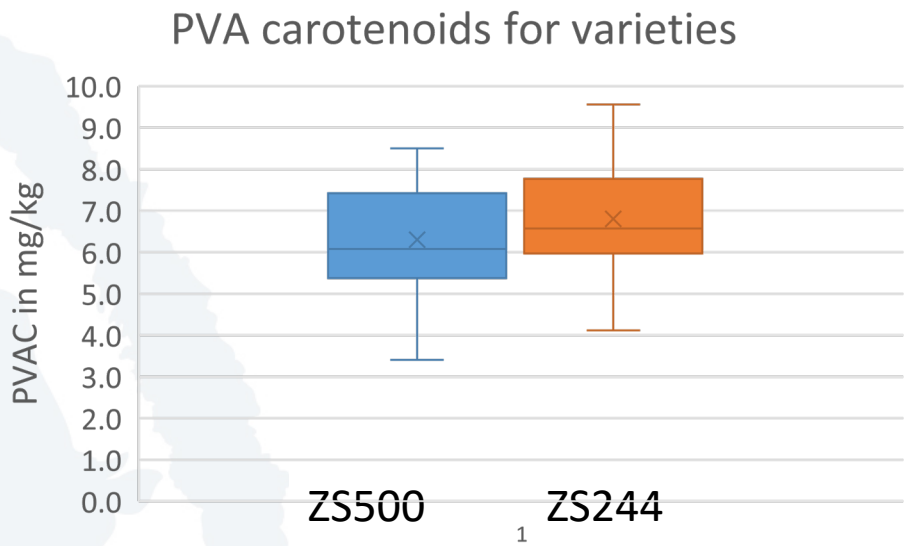


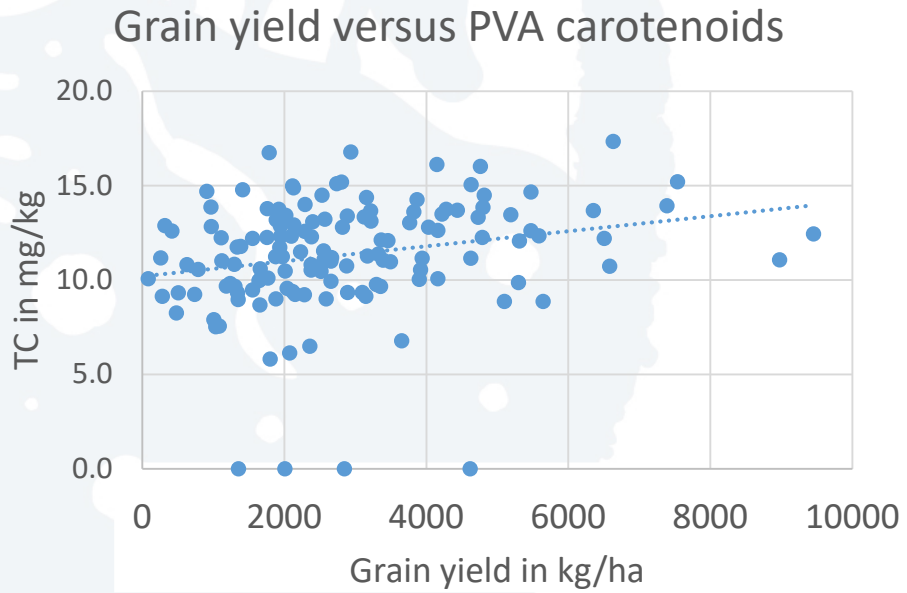


- Maize grain yield results from 60 on-farm trials, testing 4 varieties in home and out fields, 2021 season

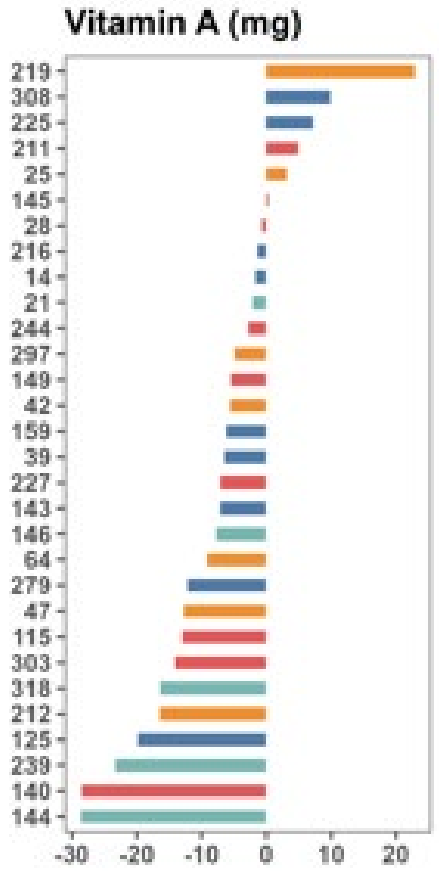
Treatment effects on ProVitamin A Carotenoid concentration

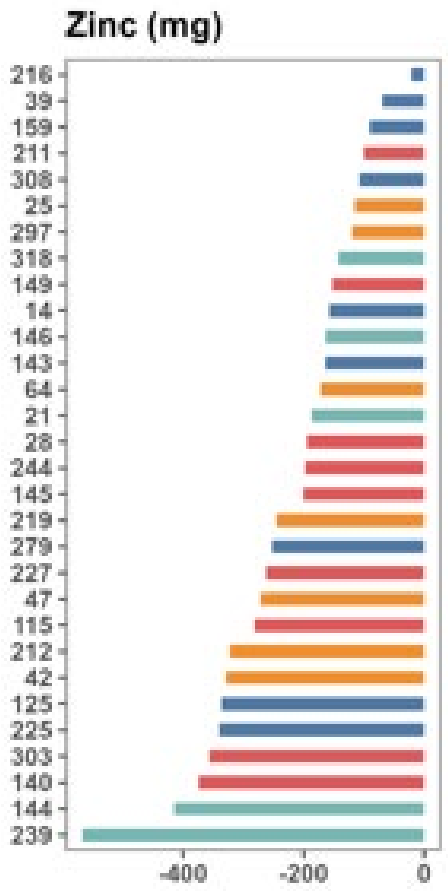


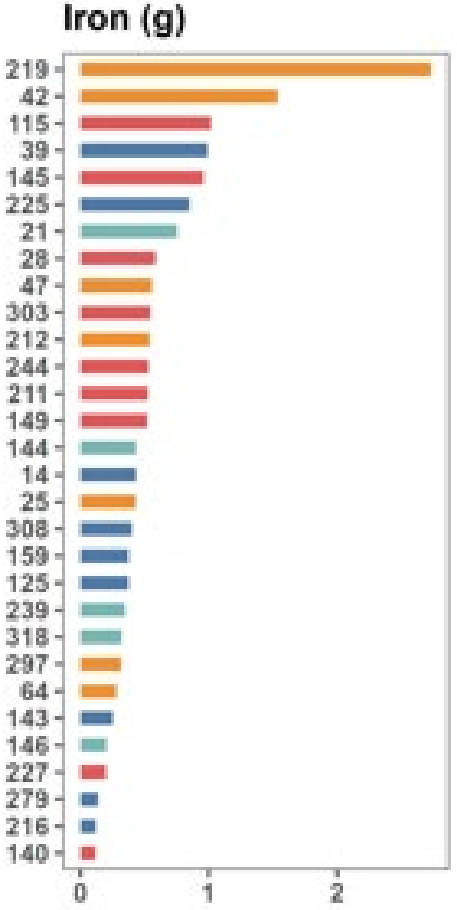


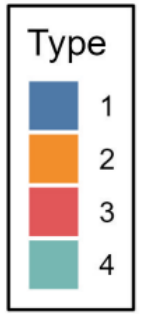


Results from a meal monitoring (1 full week) of 30 households (stratified sampling based on farm typology) conducted in April 2021









T1: large farms,
T2: Intermediate farms,
T3: like T2 but female headed,
T4: small farms

Independent of farm type, most households in Murewa seem to have inadequate uptake of Vitamin A and Zn, uptake of Fe seems to be mostly sufficient

Conclusions

- A one-week meal monitoring with 30 households established deficient uptake of Vitamin A and Zn
- Soil analysis indicted slight soil fertility advantages for home fields which contributed to substantially higher yields on home fields
- Biofortified maize lines are yielding slightly lower than control lines
- But the field type/soil fertility did not affect the grain PVA concentration


Thank you !
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