Objective 2. Quantify the health economic impact of the addition of Zn-fertilizers to the Zn concentration of high Zn wheat variety (zincol/NR-421) grown at sites of contrasting available soil Zn status.

Prof. Martin R. Broadley & Dr Munir H. Zia

http://gtr.rcuk.ac.uk/projects?ref=BB%2FP02338X%2F1
NARC/HarvestPlus variety * zinc fertilizer studies

NARC, Islamabad, March 25th 2018
Soil Fertility Mapping of Irrigated Land in Pakistan

DTPA-extractable Zinc (Zn)

Probability of topsoil zinc being lower than 1 mg/kg
- Exceptionally unlikely (0–1%)
- Very unlikely (1–10%)
- Unlikely (10–33%)
- About as likely as not (33–66%)
- Likely (66–90%)
- Very likely (90–99%)
- Virtually certain (99–100%)

Administrative areas
- District
- Province


Map prepared March 2018. Map Datum WGS 84.
Field experiments

Three sites (‘high’, ‘medium’, ‘low’ DTPA-extractable soil Zn)

Faisalabad, Punjab (mechanised): ‘high’
NARC, Islamabad (mechanised): ‘medium’
Pir Sabak, KPK (hand-sown): ‘low’
Field experiments
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- Faisalabad, Punjab (mechanised): ‘high’
- NARC, Islamabad (mechanised): ‘medium’
- Pir Sabak, KPK (hand-sown): ‘low’

Two varieties (Zincol-2016; local variety, e.g. NARC 2011)

Eight fertilizer treatments (soil and foliar Zn fertilizers / combinations)

Four replicates
# Field trials

<table>
<thead>
<tr>
<th>Location</th>
<th>Texture</th>
<th>pH (1:2.5)</th>
<th>DTPA- Zn (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faisalabad, Punjab</td>
<td>Sandy loam</td>
<td>8.1</td>
<td>1.42 – 1.50</td>
</tr>
<tr>
<td>NARC, Islamabad</td>
<td>Silt loam</td>
<td>8.3</td>
<td>0.34 – 0.67</td>
</tr>
<tr>
<td>Pir Sabak, KPK</td>
<td>Sandy loam</td>
<td>8.3</td>
<td>0.20 – 0.24</td>
</tr>
</tbody>
</table>

*diethylenetriaminepentaacetic acid*
NARC, Islamabad, March 25th 2018
Possible yield increase with soil-applied Zn fertilizers?
Plots with foliar Zn fertilisers show minor leaf damage.
Quantify health economic impact...

Valuing increased zinc (Zn) fertiliser-use in Pakistan


Received: 12 February 2016 / Accepted: 13 June 2016
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Zinc fertiliser use in Pakistan (2014)

Engro data from NFDC (2013); FFC (2014); ~50% of Zn market
Important role for fertiliser sector: blending Zn and granular fertiliser in Punjab, Pakistan (photo, Dr Munir Zia, Fauji Fertilizer Company)
Important role for fertiliser sector: blending Zn and granular fertiliser in Punjab, Pakistan (photo, Dr Munir Zia, Fauji Fertilizer Company)
Important role for fertiliser sector: blending Zn and granular fertiliser in Punjab, Pakistan (photo, Dr Munir Zia, Fauji Fertilizer Company)
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1500 sample sites for Zinc
DTPA-extractable Zinc
- ≤ 1 mg/kg
- > 1 mg/kg

Map prepared March 2018. Map Datum WGS 84.
Scaling of new varieties well-underway within National and Provincial Research Organisations with HarvestPlus Pakistan, supported by private sector engagement (photo credit, Dr Munir Zia, Fauji Fertilizer Company). December 22nd 2017.
Objective 2. Quantify the health economic impact of the addition of Zn-fertilizers to the Zn concentration of high Zn wheat variety (zincol/NR-421) grown at sites of contrasting available soil Zn status.

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