



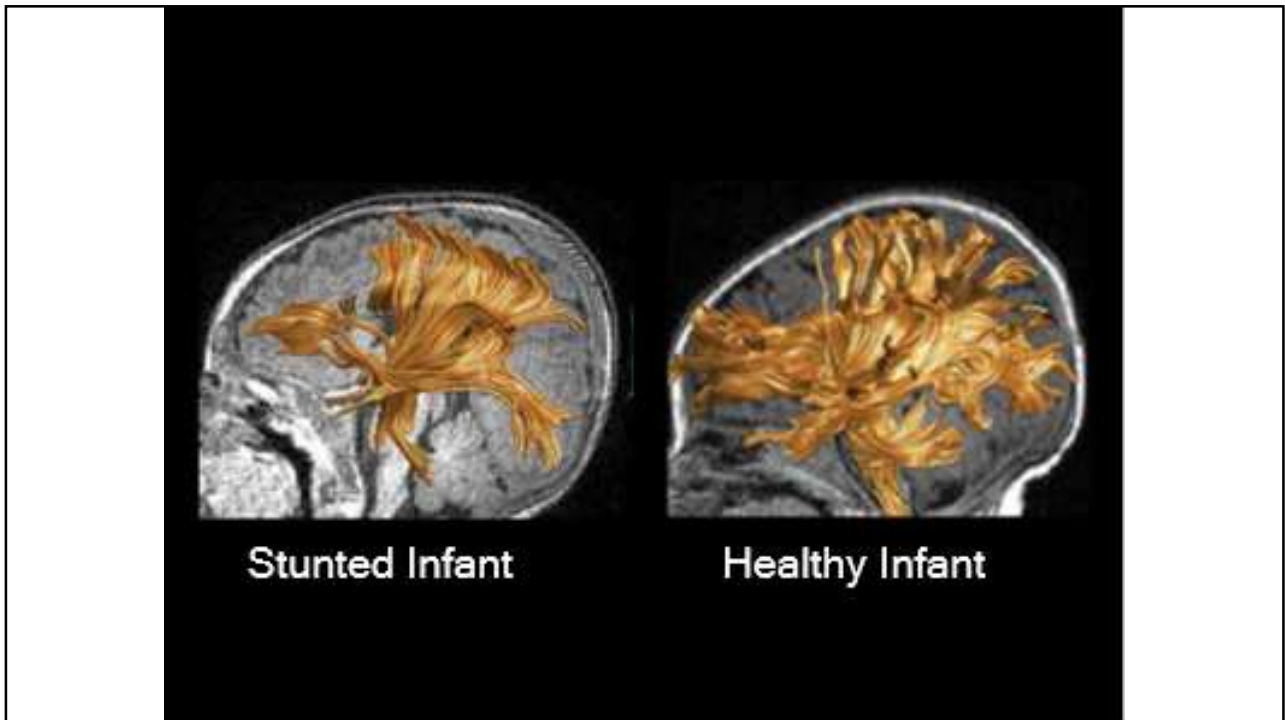
Addressing Micronutrient Deficiencies Through Agronomic Biofortification

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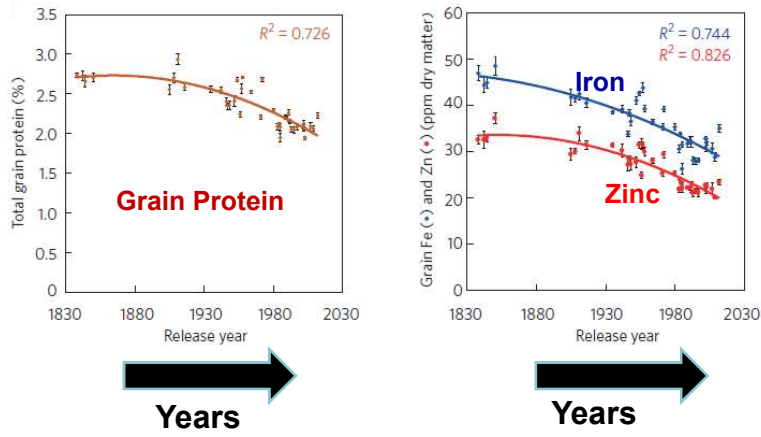


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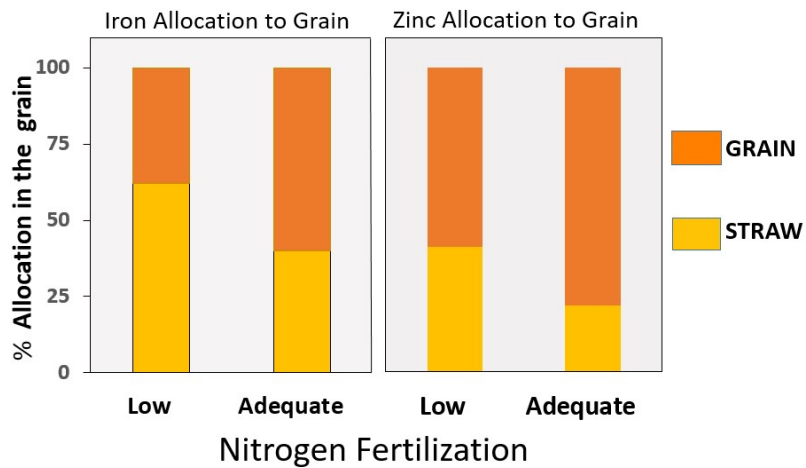
Historical changes in grain protein and grain zinc and iron concentrations (with increasing grain yield)



Shewry et al. 2016, Nature Plants

3

Effect of low and adequate nitrogen fertilization on allocation (translocation) of zinc and iron from leaves into grain in wheat



Kutman et al., 2011, Plant and Soil

4

Average **grain concentrations of zinc, iodine (I) and selenium** after **application of a micronutrient cocktail to foliar sprays for wheat grown** in China, India, Pakistan, Mexico, South Africa and Turkey

| Treatment | Zinc (mg kg ⁻¹) | Iodine (µg kg ⁻¹) | Selenium |
|-----------------------------|--------------------------------|----------------------------------|------------|
| No (control) | 29 | 24 | 92 |
| Treatment of Zn+I+Se | 48 | 249 | 338 |

Zou et al., 2019, J. Agric Food Chem

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Effect of High Zinc Wheat Intervention on Morbidity Indicators

| Indicator | High Zinc Wheat Subjects | Low Zinc Wheat Subjects | Days of Sickness Averted For ~ 1300 Subjects Over 180 Days | Difference Significant at 5% Level of Confidence? |
|---------------------------|--------------------------|-------------------------|--|---|
| Children 4-6 Years | | | | |
| Days With Pneumonia | 203 | 244 | 41 | YES |
| Days With Vomiting | 60 | 99 | 39 | YES |
| Women 15-49 Years | | | | |
| Days With Fever | 999 | 1092 | 93 | YES |

Sazawal S, et al. Nutr J. 2018 17(1)

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In Conclusion ...

“Such intimately related subjects as agriculture, food, nutrition and health have become split up into innumerable rigid and self-contained little units, each in the hands of some group of specialists. The experts, ...soon find themselves...learning more and more about less and less...The remedy is to look at the whole field covered by crop production, animal husbandry, food, nutrition, and health as one related subject and...to realize...that the birthright of every crop, every animal, and every human being is health.”

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Sir Albert Howard, 1873-1947

“The Soil and Health,” 1945

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