P 2.7: Fortification of iron and zinc in groundnut by seed soaking treatments

M. K. Mahatma, L. K. Thawait, Aman Verma, Sushmita, A. L. Rathnakumar, A.L. Singh
ICAR-Directorate of Groundnut Research, Junagadh-362001, Gujarat, India
Email: maheshmahatma@gmail.com

Micronutrient fortification in food is an effective strategy to overcome its malnutrition in developing countries. An investigation was carried out to enhance iron (Fe) and zinc (Zn) content in groundnut with reduced phytic acid content. Fifty gram seed of five popular groundnut cultivars (Girnar-2, GG-20, GJG-22, JL-776 and TG-26) were soaked in aqueous solution of ferrous sulfate (25 or 50 mg/100 ml) or zinc sulfate (25 or 50 mg/100 ml) for 8 and 16 h and dried in oven at 50 °C. Fe and Zn content were determined using Microwave Plasma-Atomic Emission Spectrometry (MP-AES) and phytic acid content was analysed by Ion chromatography. Fe or Zn content increased in seed by soaking in ferrous sulfate or zinc sulfate in all cultivars. The Fe content of seed increased 1.2 fold in GJG0-22 and 2.3 fold in Girnar-2 with ferrous sulfate (25 mg/100 ml) for 8 h. Fe content was further increased by seed soaking with 50 mg of ferrous sulfate. Similarly, Zn content in seed also increased 1.5 fold in TG-26 and 2.0 fold in GG-20 with 25 mg zinc sulfate while it was further increased in 50 mg zinc sulfate for 8 h. Increase of seed soaking time from 8 h to 16 h reduced Fe content while enhanced Zn content. Interestingly, phytic acid content was reduced in groundnut due to seed soaking for 8 h in different solutions. Thus, soaking of groundnut seed with iron and zinc sulfate solution for 8 h can be used as a pre-processing technique to increase their content in addition with reduced phytic acid content.

P 2.8: Biofortification in rice for Zinc and Iron

Mahantashivayogayya K, Basavaraj S Lakkundi, Mallikarjuna Swamy B P
All India Coordinated Rice Improvement Project,
Agricultural Research Station Gangavathi-583227
University of Agricultural Sciences, Raichur
mahant.shivayogayya2@gmail.com

Genetic engineering and gene editing are precise technologies that can streamline the breeding process and introduce rice traits that cannot be significantly improved through conventional breeding. Biofortification is the process of improving the nutritional quality of food crops. Zinc deficiency is a major cause of stunting among children under the age of five who are at of compromised cognitive development and physical capability. Globally, more than 1.6 billion people are anemic. Iron deficiency anemia (IDA) can affect productivity and cause serious health consequences including impaired cognitive development in children, a weakened immune system and increased risk of morbidity (WHO,2016).

Presently grown popular high yielding rice varieties are poor supplier of zinc and iron in their polished form. As an essential part to alleviate hidden hunger, initiation was started at