HarvestPlus GLOBAL ZINC FERTILIZER PROJECT: CURRENT RESULTS AND FUTURE TASKS

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Zinc deficiency represents a common micronutrient deficiency problem in human populations. Low availability (e.g., solubility) of soil Zn is also an important global problem. Since food crops, particularly cereal crops, are inherently low in grain Zn concentration, growing them on potentially Zn-deficient soils further reduces their Zn concentration and thus dietary intake of Zn. Soils with low availability of Zn can potentially diminish the expression of high grain Zn trait and limit the capacity of newly developed cultivars to absorb adequate Zn from soils and accumulate in grain. Fertilizer strategy represents a quick and effective practice to biofortify food crops with Zn at desirable levels by keeping sufficient amount of available Zn in soil solution and maintaining adequate Zn transport to the seeds.

HarvestPlus Global Zinc Fertilizer project has been developed to test and identify new zinc-containing fertilizers and application methods for increasing grain concentration of Zn and grain yield as well in 8 countries. Grain Zn concentrations were significantly and consistently increased by foliar Zn applications in all countries (as average by 2-fold), while soil Zn applications was less effective. Changes in grain yield upon Zn applications ranged between 0 to 22 %. Wheat has been found to be the most promising cereal for increasing grain Zn through foliar Zn fertilization. In this aspect, maize appears to be in-responsive. Timing of foliar Zn spray plays an important role in increasing grain Zn. Particular increases in Zn deposition into grain have been found when foliar Zn fertilizers are applied at a late growth stage. Improving nitrogen nutritional status of plants also resulted in positive impacts on grain Zn and Fe. Results suggested that a particular attention should be given to N status of soils and plants in efforts towards enrichment of food crops with Zn and Fe. The second phase of the zinc fertilizer project is going to focus on research tasks which might be important for motivation (and encouragement) of farmers to spray Zn. These tasks/aspects will be discussed at the meeting.