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Nutrient Management in a Low Input Production System of Syria

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Abstract

Reconciling the need for more production with ever decreasing resources is the main challenge for agricultural research in low-input systems such as those found in Khanasser valley in the North Western Syria. Over-exploitation of limited land and water resources for the production of barley for sheep fattening is combined with an unfavourable biophysical environment characterised by drought, salinity and a low availability of P and Zn resulting from the high pH of the prevailing Calcisols. Shortage of information on resources flows and inefficient resource use further exacerbate the production conditions for the rural population.

Technologies that are based on locally available resources (i.e., farmyard manure) and with a low dependence on purchased inputs (mineral fertilisers) need to address the dominant constraints of drought and P-Zn deficiencies and to assist in the development of site-specific nutrient management systems in these marginal environments. We evaluated nutrient fluxes, the availability of soil nutrients in relation to soil moisture, and the barley response to organic and mineral inputs along cross sections of Khanasser valley and tested promising technical options with local farm communities to develop site-specific solutions.

While mineral P fertiliser improved crop production mainly under the favourable on-station conditions, application of manure showed the highest efficiency on on-farm. Seed priming with P/Zn-solution exhibited superior barley establishment and increased yields by reducing P/Zn deficiencies and enhancing the crops drought tolerance in the marginal on-farm environment. Nutrients and soil moisture were higher close to the valley side, where surface on-flow water is amplified and they decreased with distance from the slopes. The possibilities and limitations of site-specific targeting of technical options will be discussed.

Keywords: Animal manure, *Hordeum vulgare*, nutrient management, phosphorus, seed priming, zinc

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