GREEN FACTS

INFOSERVICE

25 July, 2014

Protecting and enhancing soil fertility

One key to sustainable arable farming

Soil is one of the most important agricultural resources. High yields and qualities can only be harvested on fertile soils. Protecting and enhancing soil fertility therefore is an indispensible prerequisite to produce sustainably in the long run.

Nutrients maintain soil fertility

Soil fertility is an interaction of several factors. Root penetrability of the soil is one key requirement. In addition, water and nutrient supply play an important role. Not least, organic matter content and ph-value are also crucial factors.

Due to the annual harvest, nutrients and water are taken away from the soil. In order to compensate for this “loss”, farmers apply fertilisers, providing nutrients and thus optimum growth conditions for following crops.

The supply of nutrients and in particular calcium also has a stabilising effect on soil structure. A soil with a stable structure is less damageable when passed over – thus reducing the risk of soil compaction. In addition, such a soil can store higher quantities of water and allows for better root growth.

That is how ‘fertilisation according to demand’ works

Fertilisation according to the demand of the crops has to go by the amount of nutrients which are available and determined in a given soil with soil tests. The nutrient contents measured in a soil is the “current status”. In addition, other factors such as residues of the last crop, organic fertilisers and site-specific peculiarities are accounted for. The objective is to meet the demand of the following crop – and the interaction of different factors leads to individual fertilisation plans for each field.

Regular fertilisation on the basis of an assessment of the actual demand contributes decisively to maintaining soil fertility and to protecting the environment. Practical experiences of farmers, frequent information exchange with agricultural advisors and practice-oriented research also play an important role. Only fertile and intact soils will guarantee lasting, safe and high-quality future yields.

An unbalanced fertilisation with just one nutrient will not allow for success. Carl Sprengel and Justus von Liebig were aware of this fact in the 19th century already. The “law of the minimum” describes that the development of the plants depends on the tightest resource – the so-called minimum factor – whether that is carbon dioxide, water, or one of the nutrients. The “Liebig barrel” illustrates this principle: A barrel will only hold as much water as the shortest stave allows. Transferred to the fertilisation of a field, this image makes clear that the yield potential cannot be used in full already if only one of the nutrients is not sufficiently available. In case of the photo shown above, Potash (K) will be the yield-limiting factor. (photo: K+S KALI GmbH)

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