Environmentally friendly fertiliser recommendation system for Hungary

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Abstract
Considering the challenges faced by Hungarian nutrient management over the last 15 years, including the removal of fertiliser subsidies and the harsher economic environment, a new approach has been followed to elaborate a cost-saving, environmentally sound macro- and microelement fertilisation system for 48 major field crops and 38 field-grown vegetable crops, making full use of all the positive aspects of the previous systems. The intensive system evolved by the Crop Protection and Agrochemical Centre of the Ministry of Agriculture and Food ("blue booklet", MÉM NAK, 1979) fulfilled an important strategic role in ensuring a rapid improvement in the PK supplies of Hungarian soils, leading to reliable food supplies. A large proportion of Hungarian farmers are still living on the PK nutrient capital accumulated during this period, but this capital is smaller and smaller each year. The difference between the philosophy of the intensive system and the new, cost-saving, environment-friendly fertiliser recommendations is considerable. One of the major goals of the Hungarian Academy of Sciences is for the basic and applied research results achieved in the 35-academy research institutes to be utilised in practice as soon as possible. The results of plant nutrition research are no exception. Based on the correlations revealed by analysing the results of long-term experiments set up and published by various experts in Hungary, the elaboration of a novel cost-saving, environment-friendly system of fertiliser recommendations was begun in the mid-1990s. This computerised recommendation system is designed to help crop producers to use the available nutrient resources rationally and economically. The system includes fertiliser recommendations for 48 major field crops and was elaborated by experts from two academy institutes, the Research Institute for Soil Science and Agricultural Chemistry (RISSAC) in Budapest, and the Agricultural Research Institute in Martonvásár. The new, cost-saving, environmentally friendly fertiliser recommendation system provides expert advice at four fertilisation levels: 1) minimum; 2) environment-friendly; 3) balance-based 4) maximum plant nutrition level. No PK fertilisation is recommended at the minimum plant nutrition level when soil PK supplies are at least good, or at the environment-friendly level when soil PK supplies are very good or excessive. If this advice is followed, a moderate PK supply level will be achieved or maintained. At the balance-based and maximum plant nutrition levels the factors applied in each supply category are higher and a small quantity of PK fertiliser is recommended even when soil PK supplies are very good. At these two levels the aim is to achieve and maintain good PK supplies. When the initial PK supplies in the soil are excessive, however, none of the variants recommends the application of PK fertiliser, while the rates recommended to achieve the maximum plant nutrition level are still considerably lower than those prescribed by the intensive system elaborated by the Ministry of Agriculture and Food (MÉM NAK, 1979), particularly in the case of high expected yield levels, and of good, very good or excessive soil PK supplies. The new, cost-saving, environmentally friendly fertiliser recommendation system was given the honour to receive the Hungarian Innovation Grand Prize this year, which is a honour given to the whole ago-environmental research, education and extension people.

Key words: sustainable fertilization, Hungary