F O R E W O R D

Fertile soils are one of the most important resources on earth. Sustainable agriculture should use this resource in such a way that present and future human needs for food and other agricultural goods are obtained, whilst the quality of the environment and the natural resources remain preserved.

Therefore the 11th International World Fertilizer Congress was dedicated to

Fertilization for Sustainable Plant Production and Soil Fertility

Facing a world population of almost 6 billion it is evident that it is an enormous responsibility of agriculture to feed everyone. Shortage of foodstuffs are likely to further increase in developing countries and thus promote the socio-economic differences between poor and rich countries. Furthermore environmental demands on agricultural production are increasing worldwide and are closely intertwined with the quality of foodstuff, soils and drinking water.

Industrialization and waste production enforce the problem of waste disposal on agricultural farmland whereby possible benefits from nutrients have to be set against possible contamination by undesired xenobiotics. An agroenvironmental evaluation of waste products which could be used for agriculture is therefore vital before these wastes can be registered as secondary raw material fertilizers. As the preference for recycling instead of dumping is legally enforced in several countries, the number of recycled waste products will increase in future. Legal and administrative aspects on the use of recycled plant nutrients on agricultural farmland will gain further importance with the introduction of common regulations within the EEC.

One important aspect of agricultural production is animal manure management as this is the main contributor to the discrepancy between fertilizer demand and application rate. Thus resources are wasted and the environment often burdened. Therefore approaches to reduce volatile nutrient losses to the atmosphere or losses by runoff and leaching to other ecosystems are at the center of interest.

The modeling of nutrient fluxes on different scales contributes highly to a better understanding of soil physical and hydrological processes which can be transferred into corresponding fertilizer application rates. Thus the nutrient supply can be optimized and nutrient losses to the environment will be reduced. The technique to transfer this knowledge into practice is hidden behind the term Precision Agriculture. Precision Agriculture offers new dimensions of agricultural farm management practices which are no longer uniform but spatially variable on a small scale basis. The input of agro-resources addresses zones in the field which differ in key factors of soil fertility parameters which are directly related to the application itself.
It has been the invention of geostatistics by *Krige* and *Matheron*, the realization of satellite aided positioning (GPS, Global Positioning System) in the late 70´s and the development of affordable fast computers with ample storage capacities since the late 80´s which provided the key technologies for solving the historic problem of variable rate application in land use. The spirit behind all these technical aids is the basic idea of managing resources locally in order to address inputs correctly to soil features.

New approaches and technologies in fertilizer application require the transfer of scientific know-how into agricultural advisory systems. Only this way will the farmer learn at the end of the day to utilize and benefit from this new technology.

During 10 sessions at the 11th World Fertilizer Congress, advances, breakthroughs and future challenges in agricultural research were highlighted by scientists from a total of 60 countries. The outcome of these contributions is presented in the proceedings and will hopefully contribute not only to sustainable plant production and soil fertility worldwide, but also the improvement of food security and quality.

To achieve efficient printing of the proceedings, only basic technical editing of necessity was carried out.

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