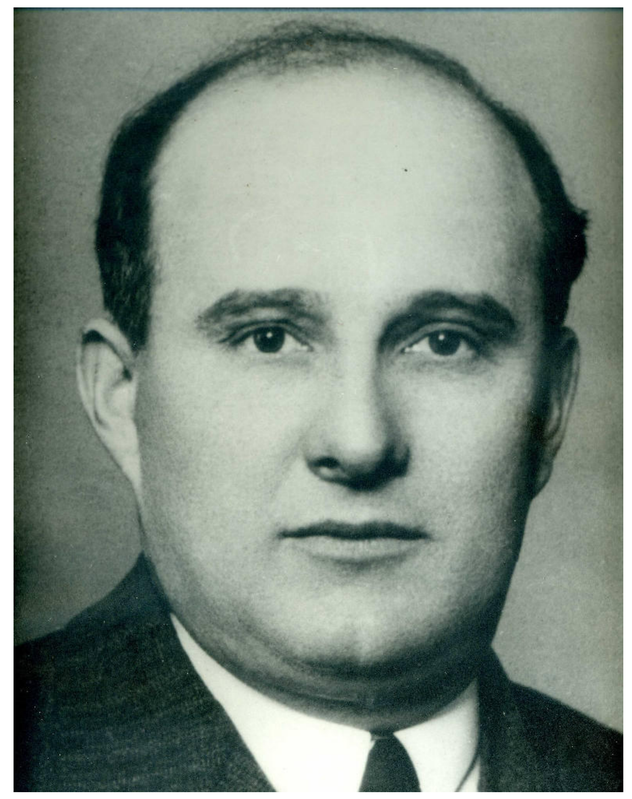
# *György VÁRALLYAY senior*

## *(1900–1954)*



**György Várallyay always aimed at simplicity and rationality. He developed several simple soil physical methods and calculation procedures for the characterization of the water management and moisture regime of soil, which were widely used by soil tillage and irrigation practice. The land use/fertilization advisory system based on soil analysis and small plot field experiments was his most important achievement, which made him a classic of Hungarian agrochemistry.**

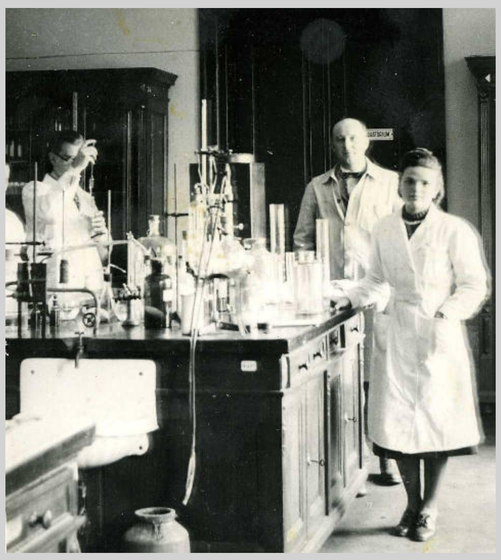
György Várallyay senior, was born on 1st January 1900 in Kisgeresd (West-Hungary) as the sixth child of a typical „progressive farmer" family. He was double talented: He inherited the love of land and agriculture from home, and he was sensitive for new achievements as a graduated chemical engineer. These two elements determined his scientific activities throughout his entire – unfortunately, short – life. He was a well-known and widely recognized representative of Hungarian agrochemistry. His modern and rational thinking and his significant achievements were both practically applicable and widely used in agricultural practice and contributed considerably to the development of agrochemistry.

He graduated from the Budapest Technical University in 1923 as chemical engineer. In 1928 he joined the Soil Science Department of the National Institute of Chemistry in Budapest. There at that time the 'Sigmond-school's young, enthusiastic and creative team (János di Gléria, Károly Páter, László Telegdy-Kováts, Sándor Schönfeld) formed a real „scientific school", contributing to the development of soil chemistry. This period gave them modern concepts and helpful experiences for their further scientific activities.

György Várallyay was appointed Head of the Chemical Research Laboratory in Sopron (1930–1933), and later in Debrecen (1933–1936), where he had the opportunity to deal with the different agrochemical aspects of plant production under varying conditions. Soil came into the focus of his interest. He studied the soil properties determining soil fertility and land productivity, which served as a scientific basis for the land use and soil management advisory service. The interpretation, determination and evaluation of the „soluble" („available") nutrient content of soil, became one of his main scientific topics and remained the priority topic of his research activities. During the Debrecen years – taking into consideration the special regional natural conditions – he carried out research and various experiments in the field of soil tillage, soil reclamation and irrigation.

In 1936 he returned to his native land, to North-Eastern Hungary, and was a scientific staff-member of the National Plant Production Research Institute (1936–1945), later the Filial Department of the Agrochemical Institute (1949–1950). Later he became head of the Department of Agrochemistry of the Agricultural Research Institute (1951–1954) up to his early death in 1954. Here, in addition to his contemporary scientific and laboratory research, he paid particular attention to the extension service, to the practical application of scientific achievements. In the Institute there was a sharp, but promoting scientific discussion between the concepts of two scientific schools:

Three classics of Hungarian soil science, from left to right: Lajos Kreybig; Dániel Fehér, György Várallyay senior



In the laboratory, Mosonmagyaróvár, 1940

1. György Várallyay senior believed and propogated that the advisory service for rational plant nutrition (the pre-concept of site-specific precision plant production technology) must be based on experiments (pot and field experiments) and soil analyses. 2. Lajos Dworák was a fanatic pioneer of „modelling", and tried to formulate and quantitatively describe the mathematical equation of soil fertility, and use it in the extension service.

His most significant scientific result was the development of an exact scientific basis for an up-to-date advisory system for harmonic, rational and efficient plant nutrition. Although he suggested to use the measured soluble („plant available") nutrient content of soil for the determination of the optimal fertilizer doses, he always emphasized that the limit values for the characterization of soil's nutrient supply (determined in different nutrient uptake simulating extractants) are never absolute and other characteristics; the nutrient requirement, nutrient uptake dynamics of the given plant; and numerous other factors must be taken into consideration when creating relative categories for the characterization of „nutrient supply status" of soils and in the determination of the optimum dose of fertilizers. György Várallyay senior developed a site- and plant-specific fertilization system, which was the conceptual basis of his up-to-date advisory systems for land use and soil management.

He helped the extension and realization of the given advices with other scientific results. Some examples: determination of the preconditions of efficient rock phosphate application; study of the efficiency of granular fertilizers; propagation of the importance of organic fertilizers and the extension of proper farmyard manure management and application technologies.

In the West-Hungarian region one of the most important limiting factors of soil fertility is strong acidity and high soil acidification. Lime application reduces soil acidity and may prevent or moderate the acidification process. György Várallyay played a decisive role in the introduction of a state subsidized lime application action.

He compiled the 1:100 000 scale soil map of Győr–Sopron–Moson county. This (unfortunately not published) map could have served as a good basis for the regional planning of site-specific plant production. He took part in the compilation of the 1:25 000 Kreybig soil maps. He compiled the „Moson" map sheet with a detailed explanatory booklet. His activities in the compilation of large scale (1:5000, 1:10000) farm soil maps was also significant. The areal units of these maps are the agricultural fields. On the field maps the main soil characteristics determining soil fertility (soil structure, moisture supply, humus content and readily available N, P and K content) in the given area were indicated by column diagrams using his relative nutrient supply category system. For each field a schematic soil profile was given, showing the texture of the different soil layers, and the average depth of the groundwater table. Recommendations for land use and agrotechnics were also given on the maps. These maps successfully served the advisory service and provided valuable information to the large-scale genetic soil mapping system developed and introduced in the early sixtees.

Pot experiment in Mosonmagyaróvár (with two György Várallyay-s), 1938

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