OPENING SPEECH

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Unfavourable climatic conditions in recent years and the increasing demand for food, as well as the increasing costs of energy and production have created for Europe's agriculture a very serious problem of finding effective ways of further intensification of agricultural production, particularly that of plants.

This situation, which has become so acute, is not of a transitory character. The necessity to increase agricultural production is growing faster than it has been so far estimated. This was discussed at the 4th Plenum of the Central Committee of the Polish United Workers' Party, and both the attitude of the Government and the press commentaries indicate, which we also realize ourselves, that to increase agricultural production is to improve the farming system, and that it also means a rational and maximal, and at the same time optimal for the agricultural environment, utilization of the natural resources, and a rapid mechanization of all farming activities.

As far as the maximum utilization of natural resources is concerned we are distinctly delayed in this branch of agricultural sciences, and there exists a distinct lack of theoretical basis for the interpretation of physical phenomena occuring in soils and in plant materials.

So far the physical phenomena have not been adequately taken into consideration in agriculture. Chemical properties conected with soil composition, fertilization, plant production, and, recently, also with the danger of environment pollution, have become of primary importance.

Fast progress in the chemization of agriculture has contributed to considerable increase in agricultural production; however, in many cases the profitability limit of using increased quantities of chemical substances has already been reached. There has also appeared a danger of harmful effect of excessive amounts of chemicals on the quality of food products, making them dangerous for health.

In this situation the physical properties both of plants and of the environment in which they grow determine further increase of crops and improvement of their quality.

As far as soils are concerned the regulation of the water-air relationships and the formation of proper structure have become of primary importance. We know that because of the progress of agricultural mechanization soil is subjected to more and more intensive cultivation and transformations which change its physical properties, often in the direction of properties unfavourable for the development and growth of plants.

On the other hand the knowledge of physical properties of cultivable plants and agricultural products is indispensable for the introduction of modern plant cultivation and construction of farm machinery. The knowledge of these properties in final effect contributes to the obtaining of qualitatively and quantitatively valuable crops and to a considerable reduction of losses during harvesting, transporting, storing, and processing of plants.

We can be proud of great achievements in increasing plant crop yields. Intensive mineral fertilization, plant protection means, modern cultivation technology, selection of highly productive plant varieties, bring about a distinct increase of crop yields. This increase, however, is not fully utilized due to lack of knowledge of plant quality features, and particularly of their physical properties.

The above mentioned problems vere underlying Prof. Dr B. Dobrzański' initiative to establish a specialitic centre of research, which was founded as the Institute of Agrophysics of the Polish Academy of Sciences, and its duties are to conduct basic and pioneering investigations, the purpose of which is the study and interpretation of the physical phenomena occuring in soils, plants, and between soil and plants. Quantitative estimation of the physical parameters will allow to

1) study the dynamic correlations between the factors of plant life environment and the physical properties of plants and agricultural crops,

2) determine the influence of farm machines and implements on the physical properties of soils and cultivable plants,

3) give indices for the constructors of farm machines and implements in order to increase their effectiveness of operation,

4) provide information for modern plant cultivation.

Investigations of the physical properties of soils are conducted in the Institute of Agrophysics parallel to investigations of their physico-chemical and biological properties effecting the physical conditions of plants. Studies are also carried out here on methods of the improvement and proper utilization of soils.

The problems studied in the Institute are, for this country, of pioneer

character, and there are only few centres dealing with them in the world. The results obtained so far by this relatively young Institute and its active staff are considerable. They concern above all the developed investigation methods and prototype apparati, definite physical parameters of soils and cereals and the influence of the factors of soil environment on the physical properties of these plants.

From the very beginning the activity of the Institute of Agrophysics has been based on close cooperation with numerous scientific institutions both in Poland and abroad. In so specialistic and important a discipline scientific progress is determined by cooperation and rapid exchange of experiences.

Contacts with foreign centres, based mainly on bilateral agreements, consist in exchange of experiences, publications, rare apparati and trainees, and in organizing joined symposia and scientific conferences.

On domestic scale, this Institute has been the coordinator of investigations for several years, conducted by higher schools and institutes supervised by the Ministry of Agriculture. Attention should also be drawn to the fact that this young Institute has become a centre of training specialists in agrophysics.

The purpose of the present scientific conference on the physical properties of plant materials and their influence on technological processes is to sum up the results of studies which have been carried out in this direction by the Institute of Agrophysics in cooperation with Polish and foreign scientific centres, particularly in Czechoslovakia (Department of Physics, School of Agriculture in Prague, and Institute of Agricultural Technology in Bratislava) and Hungary (Faculty of Mechanization University in Gödöllö). Recently an agreement of cooperation has been concluded with some research centres in the USSR (Institute of Agrophysics in Leningrad and Institute of Plant Cultivation in Odessa).

Furthermore, direct scientific contacts and exchange of experiences are expected to create possibilities of standardizing investigation methods and of choosing definite directions for future studies.

We hope that in the present difficult food situation, not only in this country, the problems presented and discussed at this conference will contribute to maximum utilization of the agriculturally productive areas by a properly chosen cultivation optimization of technological processes, minimization of quantitative and qualitative losses of plants and, in consequance, to the obtaining of valuable material for reproduction and consumption.

The fact is that there is no scientific discipline which requires such a broad and weighed outlook as agriculture. Every anomaly, lack of discernment, or delay, is punished with evident losses, extremely felt by the

society. Considering the problems discussed at this conference, we must boldly approach the distant time horizon and future agricultural structures, since effective progress in agriculture requires researches undertaken many years in advance.

Wishing fruitful discussions on behalf of the Department of Agricultural and Forestry Sciences of the Polish Academy of Sciences, at the same time I would like to wish all participants of this conference to return to their laboratories with new research ideas and conceptions, and full of creative energy and optimism.