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### PLANT BREEDING IN POLAND – TRANSFORMATIONS FOR THE FUTURE

Uncertainty is an attribute of the market economy at any time, at the onset of the 3<sup>rd</sup> Millennium, too. Uncertainty may also be a driving force for a development done in many fields of human activities, including plant breeding. There is no doubt that a global competition in plant breeding technology will result in a steady increase in numbers of new cultivars released onto the market. This will surely tighten competition between scientists and breeders for a consumer and therefore the market life of plant cultivars may be shortened. The latter events may possibly result in more aggressive marketing and selling strategies, what will possibly elevate cultivar releasing costs. The analyses indicate, that for a plant cultivar to stay viable and competitive on the market it is necessary to be marketed by an efficiently structured organization affluent in financial resources. Because plant breeding in Poland is expected to function in the market economy system, it should properly and efficiently be organized. A commercial company is the organization structure which functions in the latter system and such companies had been reestablished in Polish plant breeding in the last decade of the XX century.

The first commercial plant breeding companies in contemporary Poland were organized by the Agency for Agricultural Property of the State Treasury in 1993. Since then the companies have underwent a long way of restructuring and adjustments to the market. It is rather obvious, that these companies will further be shaped up in order to function efficiently and competitively. This is especially important in the light of facts showing that new foreign, often multinational, companies are entering Poland. Also, in 2000 three plant breeding companies were established by IHAR on the basis of its former experimental stations. The assumption is that, at least some of the Polish plant breeding companies

will make fusions. It is also assumed that some, even all of the companies will, finally, be privatized. The undertaken transformation steps of plant breeding in Poland to fit the market economy system will be verified by the forthcoming future. It is necessary to remember that the commercial companies will financially and legally be independent and that in the market economy the companies' fate will actually be determined by consumers, who will be willing or not to purchase products offered by the companies. In other words, the companies will need to develop plant cultivars, which suppose to be accepted by consumers and therefore competitive and profitable.

Another key factor to be a successful breeder is to have an accession to or to be able to enhance plant germplasm. However, the past shows that a highly demanded and economically valuable plant germplasm was developed by national and/or international **public, non-profit research centers**, e.g. CIMMYT in Mexico and IRRI in Philippines, Max Planck Institute in Germany, IHAR in Poland, etc..., **but not by the commercial companies**. Nevertheless, when the companies got plant germplasms, they were very efficient to produce new, accepted by consumers, highly competitive cultivars, what resulted in so called "green revolution" which reduced the hunger and malnutrition of humans in some parts of the world.

Thus, it is inferred, at first, that the preservation of biodiversity and plant germplasms enhancement are the tasks rather of research institutions, primarily of public and rarely of private domains, which usually are non-profit organizations. With the advent of biotechnology, however, some private research organizations have been able to make profit. The second conclusion is that practical plant breeding, so far done mainly in its traditional way, is rather the domain of a commercial company designed to maintain itself on the market and to make profit.

Compared to practical plant breeding germplasm enhancement requires different approach and a deep knowledge of the plant and research technologies, skills and tools and it is therefore rational that it is assigned to research institutions and not to commercial companies. In addition, modern germplasm enhancement requires a multidisciplinary and molecular approach. With the advent of molecular biology techniques and biotechnology concepts of plant breeding are being changed from classical to molecular ones. In addition to molecular marker aided breeding, the selection of genes instead of phenotypes is being put forth, mainly by genomics and related sciences. Because the latter issues were already covered by other speakers at this conference, their further discussion is not needed, here.

Nevertheless, the final conclusion is, that germplasm enhancement done by research and science with the practical part of plant breeding, perceived as the art of the activity, have become very closely associated with the advent of molecular techniques and biotechnology. Years ago, a research institution fulfilled its mission, at least, a step ahead of practi-

cal plant breeding, but with the time being the step becomes shorter and shorter and possibly after the future transformations of both cultivated plants and plant breeding organization structures we may reach a point at which the practical and scientific parts of plant breeding will disappear and both of the activities will be done in one, either public or private institution. Either way, whether the latter hypothesis will be turned to a reality or not, it should be stressed that the recent developments in biotechnology seem to indicate that the era of plant breeding perceived as a mixture of art and the science applied for the genetic improvement of crops may become a past.