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REPORTS

NINTH INTERNATIONAL RAPESEED CONGRESS "RAPESEED TODAY AND TOMORROW", 4 to 7 July 1995, Cambridge, United Kingdom

The conference, held every four years, is the major forum to discuss scientific and commercial development in rapeseed (*Brassica napus* L.). This crop is the third most important world source of vegetable oil after soybean and palm. Further confirmation of nutritional benefits of rape oil has led to increased consumption, while non-food potential is being recognized for industrial use.

Over 600 people from 32 nations participated in this meeting. There were 454 presentations, 368 of which were posters.

The programme appreciated the extensive range of interests including breeding and biotechnology, on the one hand, through applied physiology and crop protection, to industrial and human use, on the other. However, a precise separation of individual disciplines is difficult because different branches of knowledge tend to overlapping. Particular attention was paid to introduction of new methods of genetic engineering and biotechnology.

Many papers report on heterosis for seed yield occurring in *Brassica* hybrids. Rapeseed in contrast to other *Brassica* species is mostly self-pollinated, which is one the main factors contributing to hybrid varieties. Several pollination control systems are currently being used to produce hybrids. One of important events of 1994 was registration of the first composition "hybrid line" named Synergy in France. In Poland the goal of investigations is to obtain CMSpol system for seed production of winter rapeseed hybrids which were presented by I. BARTKOWIAK-BRODA.

Since the last international rapeseed meeting in Saskatoon a remarkable progress has been made in the field of cell and tissue culture as well as in the transformation efficiency in *Brassica*. Techniques such as embryo and microspore culture are frequently considered as routine breeding methods. Protoplasts, microspores and doubled haploid plants are widely applied in genetics, physiology and crop protection. New varieties (e.g. Cyclon, Mikado, Quantum) from DH lines have been licenced.

Several constructs have been introduced into rapeseed by *Agrobacterium* mediated transformation, but there is still little data in literature concerning transgenic stability in this species. There is some interest in using DNA uptake into protoplasts and in the particle bombardment. The range of agronomically important characters has been modified including disease resistance, pest resistance (B. GREZES-BESSET et al.) and seed storage products (J. KOHNO-MURASE et al.). The first example of transgenic *Brassica napus* is the cv. "Innovator", with complete weed controls has been registrated by M.M. OELCK et al. from AgrEvo (Canada). In the future the main limiting factor to use transformation for modifying crop plants will be the availability of cloned genes.

Extensive activity has, taken place in the area of wide hybridization in *Brassica* with the goal to transfer desirable traits between the species. Several reports dealing with interspecific and intergeneric hybridization for various purposes were presented at this Congress. LI et al. reported results of intergeneric cross between *Moricanda* and *Brassica napus*. Progeny of this hybrid may be useful in the transfer of good oil quality to *Brassica* crops. FROSBERG and GLIMELIUS obtained asymmetric hybrid by protoplasts fusion of *Brassica napus* as the recipient genom and *Arabidopsis thaliana* as the donor. They transferred only part of the donor genom excluding as much as possible of the unwanted DNA. The advantage of somatic hybridization as compared to genetic transformation is that the gene or genes encoding a trait of interest should not be identified or isolated on the molecular level.

The importance of physiological factors affecting seed yield of *Brassica* crops was emphasized by many workers. Results of studies presented by D. BING and G. STRINGAM showed that seed yield, seed number per pod, and seed weight are very complex traits highly influenced by both genotype and environments. Information reported by A. ARTHUR and M. FORD about the range and type of variation in a number of metrical characters associated with yield in rapeseed was obtained using recombinant of doubled haploid lines. Data for these characters is now being subjected to various statistical analyses to determine association between the trait mean and markers used to construct genomic map. The presence of significant genotype-environment interactions and their effect on experimental results have been the cause of researcher's and breeders concern for many years. Moreover, new problems have arised due to man interference in the environment and ecosystem. For instance, who could have imagined in the beginning of the 80's that a remarkable idea to reduce SO_2 emission from burning fossil fuels would have an impact on S deficiency, nutrient disorder in European rapeseed cropping and honey production twenty years later?

In the meantime, thorough biochemical experiments should be aimed at explaining, at the molecular level, a number of observed environmental effects. New genetic modification techniques still in the experimental stage are being used to generate plants with novel, beneficial traits. But current research in this field raises some doubts regarding public health and safety, as well as environmental and ethical aspects. Therefore, rapeseed varieties which were produced by conventional breeding methods have still been used for

human and animal nutrition. Consequently improved varieties should contain a very low level of glucosinolates and should be free of erucic acid. However, breeding double zero rapeseed requires very precise and accurate methods of biochemical analyses.

Advantages of rape-oil are a high level of fat and monounsaturated fatty acid as will as the fact that like other vegetable oils, it is cholesterol-free. Several studies found that rape-oil is effective in lowering human plasma total and LDL cholesterol and that it alters parameters linked with arteriosclerosis which is the main factor leading to cardiovascular disease.

Pressure of polluted environment and a requirement of renewable energy resources have awakened fresh interest in the use of vegetable oil as a non-fuel and non-food industrial product. The value of vegetable oil is largely determined by its fatty acid composition. Part of these possible changes can be implemented via agriculture and, particularly due to the introduction of modern industrial crops. At least high-lauric and high-petroselinic varieties produced by Calgene are being tested in the field for commercial production of detergents and polymers in the near future. Moreover, two high-erucic cvs. Hero and Mercury were developed in Canada as a source of lubricants, cosmetics and pharmaceuticals. It is also posssible to produce more radical pharmaceutical peptides in rapeseed. A Canadian Group has already developed transgenic plants containing modest levels of the blood clotting factors, and a Dutch company has produced rapeseed with a high content of phytase used for animal feeding.

At the Closing Ceremony of the Congress the Groupe Consultatif International de Recherche sur le Colza decorated eminent scientists Dr. R. Keith Downey and M. Jacques Morice with medals. A pleasant accent for Polish delegation was the award for the most informative poster demonstrated by T. Płatek, A. Katzer, M. Jerzewska from the Meat and Fat Institute in Warsaw.

Authors of this report took part in one of pre-congress tours to the John Innes Centre in Norwich, one of the main world's institutes dealing with plant and microbiology genetics. The excursion comprised a visit to laboratories, experimental fields and the John Innes Foundation Special Collection of rare botanical books containing the first herbal prints and Mendel's original papers.

All presented reports have been published in the Proceedings of the Ninth International Rapeseed Congress.

The 10th International Rapeseed Congress "New Horizons for an Old Crop" will be held in 1999 at Canberra National Convention Centre in Australia.

Angela NAŁĘCZYŃSKA, Teresa CEGIELSKA
Plant Breeding and Acclimatization Institute,
Poznań, Poland

INTERNATIONAL CONFERENCE " AGROBIOTECHNOLOGY '95"
Center of Science, Polish Academy of Sciences
September 17-20, 1995, Poznań, Poland

Organizers: Institute of Bioorganic Chemistry, Polish Academy of Sciences and Agricultural University of Poznań

The general idea of the conference was to present the relationship between basic research and modern agriculture and food industry. The discussed topics concerned molecular biology, genetics and genetic engineering as well as their applications in food production and environment protection. A special emphasis was laid on the research oriented towards agriculture. Last but not the least the legal aspects of agrobiotechnology were also reviewed.

At the *opening session*, two key-note lectures under the common title: "From Basic Research to Agrobiotechnology" were presented by professors Volker ERDMANN (Berlin) and Jonathan TRAMPER (Wageningen). These two distinguished scientists talked about "RNA technology" (Volker ERDMANN) and "Cell factories" (Jonathan TRAMPER).

The Opening ceremony also included welcome addresses and a concert, followed by a cocktail party.

Session I "Molecular biology and genetic engineering". The speakers discussed molecular background of modern plant and animal biotechnology. The problems of nitrogen fixation, mapping of animal genome and isolation of specific genes (in plant and animal systems), modern methods of breeding including transgenic plants (rice) and animals were in the focus of the discussions.

Session II "Intellectual property rights, legislation and biosafety" (we called this session "The other face of biotechnology"). The panel gave an excellent review of the topic, covering the important issues and introducing a reasonable level of comment on the need to balance the risk and benefits. We cannot predict the risks and, therefore, we must be very careful when plants or even animals carrying new nucleic acid sequences are released. It is necessary to determine guidelines and regulatory rules and to register all types of genetically modified organisms. The participants found the problem of food safety of genetically modified agricultural products to be of special interest.

Session III "Plant and animal biotechnology". We all very were pleased to hear about an advance in the development of new crops and animal genome analysis. We hope that new agriculture combined with genetic engineering will help to solve the problems ahead of us: improvement of food production and reduction of losses at harvest and during storage. The highlights of this session included cryopreservation of plant cells, micropropagation of plants and cloning in farm animals, production of secondary metabolites, and application of transgenic technology to animals.

Session IV "Bioprocessing and environmental biotechnology". The preventive strategies are of special importance for clean-up bioprocessing. There are several techno-

logies to be highlighted in this field: biosensors and vermicomposting, biocatalysis and functioning of lipases as well as functions of carbohydrates. They differ extensively, but all of them serve the protection of our environment.

Closing commentary and award for the best poster communication

The presented lectures and discussions have been certainly an important contribution to scientific advancement in agrobiotechnology and to international exchanges. The participants have found the meeting to be of high scientific value. The common opinion was that it is necessary to organize a continuation of similar conferences in the future. The most important, however, was the fact that many young scientists and students participated in the sessions. The high scientific level was due to excellent speakers, Polish and foreign scientists, who devoted their time and efforts to share their knowledge with us.

The award for the best poster was given to Dr. J. BURZA from Warsaw Agriculture University for a communication describing natural fluorescence of cucumbers.

The participants concluded that organization of biotechnological conferences is worth a continuation. Pharmaceutical and medical applications of biotechnology were suggested as potential topics for the next symposium.

The conference was attended by over 250 scientists from 16 countries. Over 30 lectures and almost 100 poster communications were presented. The selected papers presented during the symposium will be published in the Polish journal BIOTECHNOLOGIA in issues 1 and 2/1996.

Tomasz TWARDOWSKI
Chairman of the Organizing Committee