INFORMATION AND REPORTS

THE SIXTH CONSULTATION OF THE F.A.O. RESEARCH NETWORK ON SUNFLOWER

(Szeged, Hungary, July 28—31, 1987)

The sixth Consultation of the F.A.O. Research Network on Sunflower, sponsored by the F.A.O. Regional Office for Europe, and organized by the Co-ordination Centre — the Research Institute for Cereals and Industrial Crops of Fundulea, Romania and the Cereal Research Institute of Szeged, took place in Szeged, in the period of 28—31 July, 1987.

1. **The purpose** of the Consultation was to review and analyse the results of the scientific co-operation obtained in the last three years and to discuss and organize its future activity, as well as to facilitate a large exchange of experience and knowledge in the main fields of sunflower research and production.

2. **Participation.** The Consultation was attended by 67 delegates from 16 countries (Bulgaria, Canada, Czechoslovakia, France, F.R. of Germany, Greece, Hungary, Italy, Marocco, Portugal, Romania, Spain, Turkey, U.S.A., U.S.S.R. and Yugoslavia), one international organization (International Board for Plant Genetic Resources), and 18 observers from 6 countries (Argentina, Austria, France, Italy, United Kingdom and U.S.A.) (fig. 1 and 2).

3. **Opening of the Consultation.** On behalf of the Director-General of F.A.O., the Consultation was opened by Mr. H. Őlez of F.A.O.'s Regional Office for Europe. He welcame the participants and thanked the competent authorities of Hungary, particularly the Ministry of Agriculture and Food, and the Cereal Research Institute for their kind invitation to host the Consultation in Szeged. Special thanks were extended to Dr. J. Frank for the excellent preparation of the Consultation. Mr. Őlez appreciated the important role of the Network in the introduction and improvement of sunflower production in numerous countries around the world as well as in developing a complex research programme with important topics.

The Consultation was greeted by Mr. I. Doboczky, Deputy Minister of the Ministry of Agriculture and Food. He stated that Hungary has taken an active part in sunflower research and cropping, and has co-operated sustainedly through the F.A.O. with many countries in this field. Mr. Doboczky mentioned that the Cereal Research Institute of Szegad has been involved in the elaboration of a large amount of data present in the European genetic banks and will transmit the information to the interested institutions.

Mr. Imre Szaniel, Director-General of the Cereal Research Institute, gave a brief history of Szeged as a cultural and scientific centre of the southern part of Hungary, presented the main achievements of the institute and wished the participants an useful meeting and a nice stay in Hungary.

Dr. J. Frank (Hungary) was elected Chairman and Dr. J. Fernandez-Martinez (Spain) and Prof. A. Kováčik (Czechoslovakia), Vice-Chairmen.

The Consultation adopted the agenda and timetable.

4. **The programe of work** combined a comprehensive analysis of the past and future activities of the subnetworks with presentation and discussion of scientific papers or communications and with visit of sunflower nurseries and commercial fields. The participants had thus the possibility to debate not only theoretical aspects of the joint investigations, but also the methodology and experimental techniques.

The Co-ordinator of the Network, dr. A. V. Vrânceanu (Romania) presented the general report on past activities since the last Consultation (1984), and proposals for the next four year period (1987—1991). He appreciated that the achievements resulted from this scientific co-operation were relevant and conclusive and underlined the contribution of the five research subnetworks to the implementation and development of their work programmes. The general report contained also proposals for revitalizing or reorganizing certain subnetworks, which were afterwards debated and adopted.

On the first day of the Consultation, the Liaison Officers of the subnetworks, Dr. F. M. Stoenescu (Experimentation of sunflower cultivars), Prof. A. Kováčik (sunflower applied genetics), Prof. D. Skorić (Collection, evaluation and conservation of wild species

and their use in sunflower breeding programmes), and Dr. R. Fereres (Eco-physiology of sunflower production) presented the results of the joint investigations carried out in the last three years and made proposals for further development of the scientific research co-operation and improvement of the joint methodology and experimental technique.

In the absence of dr. Y. Regnault, Liaison Officer of the subnetwork on sunflower integrated protection, Dr. H. Iliescu (Working group on integrated disease control), Dr. G. P. Vannozzi (Working group on integrated weed control) and Dr. M. Ačimović (Working group on sunflower disease mapping) presented their reports and proposals.

5. **Summary of main achievements.** During the last 12 years since the establishment of the Network, a total of 172 hybrids and 25 open pollinated varieties representing the most recent achievements of the breeding programmes in the world were tested for their yield, oil content, disease resistance, resistance to adverse environments, fatty acid composition and morpho-physiological traits. This information proved to be an useful guide for sunflower growers interested in the identification of the best cultivars for their specific environmental conditions and cropping practices. Uniform evaluation of data for different entries and for a long-time check cultivar permitted the estimation of the genetic contribution to seed and oil yields, as well as to oil content, to the main morpho-physiological traits and to resistance to diseases and to unfavourable environments. Valuable conclusions for sunflower breeders were drawn.

Co-operation in the field of sunflower applied genetics has been developed among seven countries (Czechoslovakia, France, Italy, Romania, Spain, U.S.A. and Yugoslavia) with respect to the genetic control of the main quantitative traits involved in sunflower production. Genetic factors for resistance to stem canker *(Phomopsis helianthi)* have been identified and the first resistant hybrids have been released. New sources of cytoplasmic male sterility coming from interspecific crosses of wild species to the cultivated sunflower have been identified.

Important collections of wild species have been enlarged and screened in five countries for their resistance to diseases and stress conditions. Valuable results have been obtained in botanical and morphological characters and cytogenetic investigations. In order to transfer the positive characters of wild species into the cultivated sunflower, a large number of interspecific crosses were performed and back-cross generations were obtained. This breeding work is actively continued.

In respect of the integrated control of diseases, it was found that, in addition to the cropping practices, both genetic and chemical factors should be involved in determining the quantity and quality of sunflower crop. The joint programme on the biology and control of the fungus *Phomopsis helianthi* has given useful information which would permit effective control of this new and harmful disease. Sunflower disease mapping was conducted in eight European countries over the last three years.

The subnetwork on ecophysiology of sunflower production received information from various countries in order to review their present research status on this matter. In France, research in recent years has been focused on nitrogen nutrition and its effects on yield determination. In Spain, it was centred on drought tolerance and the development of drought—tolerant cultivars.

6. **Scientific communications and dissemination of results.** On the second day of the Consultation, 15 scientific papers, mostly resulted from the co-operative research investigations, were presented and discussed. They contained results from the following fields of the Network activity : genetics (2), breeding (3), evaluation of wild species (1), biotechnology (1), sunflower diseases (6), integrated weed control (1), and ecophysiology of sunflower production (1). Some of the papers are published in the present edition of HELIA, and the others in the next one.

Nine editions of the Scientific Bulletin of the F.A.O. Research Network on Sunflower HELIA, edited by the Co-ordination Centre of Fundulea, Romania, are already in practical use in almost all sunflower producing countries.

7. **Organizational matters.** The subnetworks held individual meetings on the third day of the Consultation, and discussed the details of the future scientific co-operation, the improvement of the experimental methods and technique, data processing and interpretation etc.

Taking into consideration the recommendations of the ECA, the Consultation adopted the following proposals for improvement and re-organization of the joint research activity :

— Development of sunflower cultivar experimentation with the view of studying yield stability, environmental adaptation and genotype similarity and diversity. A more careful evaluation of the reaction of sunflower cultivars to the attack of various parasites will be performed in each location under natural infection. Controlled infections will be conducted in at least five special centres : Fargo (U.S.A.) for testing the reaction to different physiological races of *Plasmopara helianthi*, CETIOM (France) for resistance to *Sclerotinia sclerotiorum*, Novi Sad (Yugoslavia), for resistance to *Phomopsis helianthi*, Fundulea (Romania) for *Plasmopara helianthi* and *Orobanche cumana* resistance, and Edirne (Turkey) for resistance to different races of *Orobanche cumana*.

— Integration of the subnetwork on sunflower applied genetics and the subnetwork on wild species in a new subnetwork entitled "Sunflower genetics and breeding", with its Liaison Centre in Novi Sad, Yugoslavia (Dr. D. Skorić). This integrated subnetwork will comprise five working groups already existing within the former two subnetworks.

— Establishment of the working group on the use of biotechnology in interspecific hybridization for overcoming the problems encountered while using wild species in sunflower breeding. This project will initiate works on embrio culture, tissue and cell culture, androgenesis and gynogenesis. The biotechnology working group will be co-ordinated by the University of Giessen, F. R. Germany (Prof. W. Friedt).

— Re-organization of the subnetwork on integrated protection as subnetwork on "Sunflower diseases" phasing out the working group on integrated weed control, due to the diminishing interest for this research topic. The coordination of the new subnetwork was entrusted to the Institute of Plant Protection of Budapest, Hungary (Dr. J. Vőrős).

— Development of joint research on ecophysiology of sunflower production, with special emphasis on growth and CO_2 assimilation, morphogenesis and seed setting, assimilate partitioning, drought resistance and root development, and yield determination.

All the other activities have been maintained and will be further developed on the basis of the topics and working plans previously established.

The Co-ordinator and Co-ordination Centre of the Network and the remaining Liaison Centres and Liaison Officers were re-elected.

So, the actual structure of the Network research activity is as presented in Table 1.

Table 1

Research plan of the F.A.O. sunflower network (1988—1991)

Nos	Subnetworks (SN) and working groups (WG)	SN WG	Period	Liaison or working group centres	Officers
1.	Experimentation of sunflower cultivars	SN	1988—1989 1990—1991	Research Institute for Cereals and Industrial Crops, 8264 Fundulea, Jud. Călăraşi — Romania	F. M. Stoenescu
2.	Sunflower genetics and breeding	SN	1988—1991	Institute of Field and Vegetable Crops, Maxima Gorkog 30, 21000 Novi Sad, Yugoslavia	D. Skorić
2.1.	Genetic study of sunflower agronomic traits.	WG	1988—1991	Research Institute for Crop Production, 16 106 — Ruzyne 507 Czechoslovakia	A. Kováčik
2.2.	Genetic study of physiological and biochemical characters	WG	1988—1991	National Research Centre for Oil Crops, INIA, Finca Alameda del Obispo, Apartado 240, Cordoba, Spain	J. Fernández-Martinez
2.3.	Evaluation of morphophysiological and biochemical characteristics and taxonomical aspects of wild species	WG	1988—1991	Institute of Field and Vegetable Crops, Maxima Gorkog 30, Novi Sad, Yugoslavia	D. Skorić
2.4.	Identification, study and use of cms and Rf sources in sunflower breeding	WG	1988—1991	Station l'amélioration des plantes INRA, Montpellier 34 130 Mauguio, France	H. Serieys
2.5.	Application of biotechnology in sunflower genetics and breeding	WG	1988—1991	Institut fur Pflanzenbau und Pflanzenzüchtung, Universität Giessen, 23 Ludwigstrasse, 6 300 Giessen, Germany F. R.	W. Friedt
3.	Sunflower diseases	SN	1988—1991	Research Institute for Plant Protection, P.O.B. 102, 1 525 Budapest, Hungary	J. Vőrős
3.1.	Integrated disease control	WG	1988—1991	Research Centre for Plant Protection, Ion Ionescu de la Brad 8, 71 592 Bucharest, Romania	H. Iliescu

Table 1 (continuation)

Nos	Subnetworks (SN) and working groups (WG)	SN WG	Period	Liaison or working group centres	Officers
3.2.	Sunflower disease mapping	WG	1988—1991	Institute of Field and Vegetable Crops, Maxima Gorkog 30, 21 000 Novi Sad, Yugoslavia	M. Ačimović
4.	Ecophysiology of sunflower production	SN	1988—1991	University of Cordoba, Apartado 240, 14 071 Cordoba, Spain	E. Ferreres
4.1.	Study of the basic factors limiting yield	WG	1988—1991	Research Institute for Cereals and Industrial Crops, 8 264, Fundulea, Jud. Călăraşi, Romania	M. Terbea
4.2.	Drought tolerance of sunflower cultivars	WG	1988—1991	University of Cordoba, Apartado 240, 14 071 Cordoba, Spain.	E. Fereres
4.3.	Physiology of sunflower yield formation	WG	1988—1991	CETIOM, 174 Avenue Victor Hugo, 75 116 Paris, France	A. Merrien

Since the International Sunflower Conference will take place in Italy in 1991, the participants expressed the wish to hold the next Consultation there, in close proximity to the Conference, in order to permit a wider participation.

8. **Technical visits.** The sunflower breeding field of the Institute of Szeged was visited by the participants in the afternoon of the third day of the Consultation. The competitive trial with 30 sunflower hybrids originated from the main sunflower breeding centres over the world, conducted in 24 countries and 36 locations, was evaluated. The large collection of domestic inbreds and their hybrids was also visited and appreciated.

A study trip in North-East Hungary was organized on the fourth day of the Consultation, the participants having the opportunity to examine several sunflower fields and to evaluate the potential of this crop in the respective zone. Afterwards they were guests of the Eger Agro-industrial Co-operative where demonstrative plots with numerous sunflower hybrids were visited.

Dr. **F. M. STOENESCU**

Fig. 1 — The participants in the sixth Consultation of Sunflower Network

Fig. 2 — Attending the Consultation