

INFORMATION AND REPORTS

THE EIGHTH INTERNATIONAL SUNFLOWER CONFERENCE

(Minneapolis, U.S.A., 23–27 July, 1978)

The Eighth International Sunflower Conference, held in Minneapolis, U.S.A., between 23–27 July 1978, was sponsored by the International Sunflower Association in co-operation with Sunflower Association of America. A local committee, with Mr. Ralph Hayenga as chairman and Dr. D. E. Zimmer acting as secretary-general, took care of the organization problems of the Conference and selected the most valuable and representative papers for presentation in scientific sessions.

The Conference was attended by 450 delegates representing different scientific institutions and commercial and industrial organizations from 35 countries. As expected, the largest delegation, 230 registered participants, belonged to the U.S.A. Large delegations were also sent by Canada, Yugoslavia, Australia, Spain, France, Argentina. A weak representation of the developing countries from Africa, Near East and Asia was noticed, although there is an increasing interest for the introduction and development of sunflower crop in these countries.

The total number of papers accepted for presentation was 75, the majority of them (28) belonging to the U. S. researchers. All the main aspects of sunflower breeding and cultivation were treated in special sessions, as follows: 23 papers in Genetics and Breeding Session, 17 papers in Pathology and Entomology Session, 27 papers in Physiology and Crop Management Session and 8 papers in Utilisation and Industrialisation Session.

A comprehensive information on the activity of the F.A.O. Research Network on Sunflower was presented in the Opening Session by Dr. A. V. Vrânceanu, co-ordinator of this Network. The main results obtained by the existing four sub-networks in the first biennial cycle of activity (1976–1977) were discussed along with the future development of the Network, which has extended its activity to 27 countries from Europe and other continents. It was emphasized that the Network is opened to all countries interested in sunflower crop development, with special attention to the developing countries from Africa, Near East, Asia and South America which need substantial scientific and technical support in order to

make sunflower an established oil crop under less favourable soil and climatic conditions.

The 8th International Sunflower Conference has confirmed the increasing interest manifested for the development of this crop in numerous countries, both in those with old tradition in sunflower cultivation and in countries which have introduced recently this crop or are investigating the possibilities of its development. It is worth mentioning the increase of the cultivated area in U.S.A., where the seed yields obtained last year ranged from 1,200 to 2,500 kg/ha. A slight increase of sunflower area has been also noticed in Argentina, Spain and South Africa. Various developing countries from Africa, Near East and Asia have introduced sunflower crop recently and they need an adequate technical and scientific support for the development of this crop. Thus, Morocco, Algeria, Egypt, Sudan, Iraq, Iran, Pakistan, India, grow sunflower on areas ranging from 5 to 80 thousand ha, but obtain seed yields below 1,000 kg/ha.

An important feature of this Conference was the clear-cut preponderance of investigations concerning the F₁ sunflower hybrids, with their genetic, breeding, physiological and management aspects. Although conventional breeding methods are still in full practice in some countries, mainly in U.S.S.R., the F₁ hybrid method is more and more used, due to its advantages concerning the improvement of disease resistance, plant uniformity and oil and seed yields.

The improvement of sunflower resistance to diseases was the main topic of the breeding and genetic papers, the greatest attention being paid to sunflower white rot incited by the fungus *Sclerotinia sclerotiorum*. New biological aspects of proliferation of this fungus were communicated and a new form of attack on leaves and stem was signaled. It has been revealed the fact that the high plant population contributes to the intensification of *Sclerotinia* attack, especially in fields with more than 45,000 plants/ha. Some aspects of the inheritance of sunflower resistance to the attack of this fungus were investigated and the possibility of selecting resistant cultivars by crossing the cultivated sunflower to wild species was pointed out.

Some papers presented improved techniques for testing sunflower resistance to the infection with ascospores of *Sclerotinia sclerotiorum* and to the infection caused by *Macrophomina phaseoli* (charcoal rot).

With reference to downy mildew (*Plasmopara helianthi*) there is a general confidence that this harmful disease can be controlled successfully by genetic means and already the most of sunflower hybrids developed in the last time in Romania, France, Yugoslavia and U.S.A. are downy mildew resistant. Scientific data obtained at Fundulea-Romania regarding the low expansion rate of the new *Plasmopara* races confirm the efficiency of the vertical resistance type in the case of this pathogen.

An important objective in hybrid sunflower breeding is to develop a fairly large number of good pollen fertility restorer lines. In this respect, the Yugoslav researchers communicated the identification of new restoration sources, originating mainly from the obsolete sunflower cultivars existing in the world germplasm collection.

The U.S. breeders lay special emphasis on the development of sunflower hybrids with high level of pollen self-compatibility which could yield well when the frequency of pollinating insects is very low. In this sense, synthetic high self-compatible populations have been established which are being used as starting material for selecting self-compatible inbred lines. Nevertheless, the investigation carried out at Fundulea-Romania under field and phytotron conditions proved that the phenomenon of pollen self-compatibility is fairly strong influenced by the environmental conditions, mainly by high temperatures in blooming time and short light duration of the day, so that selection for self-compatibility should be performed with priority only for regions with very low frequency of pollinating insects or with unfavourable meteorological conditions during flowering period.

With the purpose of obtaining a larger number of B lines with high general combining ability, a new breeding method was proposed which permits the usual selfing and the simultaneous backcrossing for getting cytoplasmic male-sterile analogues. Early generation evaluations can be an effective method for accumulating a large number of superior combining lines in a shorter period of time.

A special interest arose the results obtained by the Czechoslovak researchers in connection with the inheritance of earliness and the possibility of obtaining a high yielding early sunflower ideotype.

Certain papers on sunflower physiology discussed sunflower adaptation to dry conditions: the improvement of the foliar resistance to water losses; photosynthesis-transpiration relationships, the desirable development of the vegetative apparatus in accordance with the hydric system.

The wild sunflower species are potential sources of germplasm for improvement of the

cultivated sunflower. Abortion of hybrid embryos is one of the reasons why most of the wild species have never been artificially hybridized with the cultivated sunflower. Researchers from Davis, California, developed embryo culture techniques to produce interspecific hybrids between the cultivated sunflower and various related species, and hybrid plants were obtained via embryo culture.

The papers on sunflower crop management dealt mainly with the cultural practices in ecological areas where this crop has been recently introduced. So, remarkable are the research works conducted under the arid conditions of the U. S. Southern Great Plains, which permitted to elaborate the adequate management practices for dryland sunflower. Investigations were also carried out concerning sunflower response to nitrogen fertilizer application as well as the irrigation water utilization in various growth phases.

In Sunflower Utilization and Industrialization Session, interesting data were presented with respect to sunflower seed flour preparation and its utilization in human consumption and the availability of methionine in sunflower meal and its utilization in growing steers. Data were also presented concerning the extraction of sunflower pectins, their characteristics and modification. An important topic was the decortication of high oil sunflower seeds.

The Conference was followed by a scientific trip organized by the USDA North Dakota State University at Fargo. The seed farm of Casselton and certain crossing fields and commercial sunflower fields in Fargo zone were visited on this occasion. At Casselton, the best sunflower hybrids originating from U.S.A., Romania, Yugoslavia, France and other countries were introduced in special demonstrative plots. With a few exceptions, these hybrids display a remarkable hybrid vigor, although they are not enough uniform, due to some deficiencies in commercial hybrid seed production. During the scientific trip, no sunflower breeding nursery was visited, so that the participants were not able to evaluate the development of sunflower breeding programme in the U.S.A.

At the end of this Conference, the Executive Council of the International Sunflower Association elected the new Executive Committee which is made up as follows:

President: Prof. Dr. W. E. Sackston (Canada)

Vice-President: Dr. N. I. Dvoryadkin (U.S.S.R.)

Secretary-General: Dr. Jaap J. L. van Waaij (The Netherlands)

Members: Dr. A. V. Vrânceanu (Romania), Dr. A. Cauderon (France), Dr. S. Bal (India).

The Executive Council of the International Sunflower Association has accepted the proposal that Spain be the site for the Ninth International Sunflower Conference, which will be held at Torremolinos-Málaga, between 8-13 June 1980.

A. V. Vrânceanu