

INTRODUCTORY REMARKS FOR THE SUNFLOWER INFORMATION BULLETIN „HELIA“

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I am very pleased that the efforts of Dr. A. V. Vrânceanu, Co-ordinator of the F.A.O. Research Network on Sunflower, to initiate the publication of a Sunflower Bulletin have been crowned with success. This Bulletin will give a new dimension to the activities of the network and I am certain that it will be of a great value to the participating research institutions as well as to research workers generally and to university professors and students and others interested in this important crop.

The sunflower network was established by F.A.O. at the Consultation held in Bucharest from 2 to 4 October 1975. The number of co-operating institutions has increased gradually to the present 42 belonging to 29 countries. Although the network was established in the framework of F.A.O. European regional programmes, an important number of institutions from developing countries have joined in this important multilateral scientific co-operation and at the present moment they make up 11 institutions from 11 countries. This is a good example of how research institutions from developed and developing countries can co-operate together harmoniously and on an equal footing and is a decisive confirmation of the policy of the Director-General of F.A.O. to strengthen co-operation among national institutions. This is not only important from the point of view of the transfer of technology but also because it facilitates the strengthening of the scientific capabilities of the co-operating institutions from the developing countries.

I think that the joint efforts and voluntary division of work which have taken place within the network, as well as the initial results, clearly indicate that, under the auspices of F.A.O., the co-operating institutions have chosen the right path. They have concentrated on a few carefully selected problems whose solution could benefit from international co-operation and have tackled them from an applied research angle, giving the scientific community a means of stepping up its efforts and obtaining concrete results within a relatively short period of time.

The results already obtained and the encouraging prospect for future success are due to the enthusiasm of the scientists who have worked together efficiently and with dedication. The Co-ordination centre of the network is located in the Research Institute for Cereals and Industrial Crops (I.C.C.P.T.) of Fundulea, Romania and its Co-ordinator, Dr. A. V. Vrânceanu, as well as the Liaison centres of the different sub-networks and their responsible officers, deserve great praise for their successful scientific co-operation and for the excellent functioning of the whole network.

This Information Bulletin „Helia“ is the second one after that of the European co-operative research network on olives entitled „Olea“. I hope that the remaining eight networks will soon be able to have their own publications for the dissemination of the results and exchange of experience and information. This would mean that a great number of insti-

tutions and research workers could benefit from this important and voluntary multilateral and interdisciplinary scientific co-operation, already comprising about 150 national institutions from 45 member countries, 16 of which belong to countries outside Europe.

I am confident that this new publication will be received with interest and supported by all those who are already co-operating and even

those who are not yet co-operating in the sunflower network.

F.A.O. will continue to support the co-operation taking place in the network and will do its best to see that this first issue is followed by some others, in order to create an opportunity for a more systematic transmission of knowledge and dissemination of results on sunflower research.

ORGANIZATION AND OBJECTIVES OF THE F. A. O. RESEARCH NETWORK ON SUNFLOWER

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Research

Network on Sunflower

Sunflower has gained a remarkable place in the world agriculture after World War II, due to its incontestable economic advantages such as : the capacity of giving high yields of oil per unit of area and per unit of time, a favourable ratio between oil and meal (3 : 2), the facile extraction technique and the high quality of the oil in particular from the nutritional point of view. Fifteen years ago, sunflower was the oil crop number 4, after soybean, peanuts and cotton seed, but since 1967 it has occupied the second place in the world hierarchy of the oil crops.

Although the European countries possess more than 70% of the annual world grain production, an increasing interest for sunflower has been also remarked outside Europe, especially in South and North America, Asia and Africa.

Referring to the developing countries, almost all of them are suffering from an acute shortage of edible oils, which are being imported every year. The yield of various oilseed plants cultivated in these countries have remained almost stagnant while there has been a drastic increase in consumption due to rise in population and per capita income. Therefore co-ordinated actions are required to increase the total production of edible oils and the main emphasis should be given to a limited number of crops where breeding efforts have already produced cultivars of high yielding potential.

Sunflower is one of such crops which can be profitably introduced and its cultivation extended. Over the last 45 years, breeders raised the oil content in the seed from 28% to 54% and improved considerably the agronomic characteristics of the plant, adapting it to the most various environmental and cropping conditions.

With the intense rhythm that characterizes the development of the modern world technique and economy, sunflower development and extension could not be performed without the conjoint efforts of the scientists and research institutes involved in this activity. For this reason, F.A.O. has initiated and stimulated an international co-operation based on the voluntary contribution of each participating country, which is remarkably illustrated by the establishment of ten co-operative research networks sponsored by the Regional Office for Europe.

The F.A.O. Research Network on Sunflower was established at the consultation meeting held in Bucharest between 2—4 October 1975. The rules for the operation of the Network were adopted on that occasion as well as its organizational structure, centred on the existence of a Co-ordination centre (Research Institute for Cereals and Industrial Crops Fundulea, Romania) and a limited number of subnetworks corresponding to the research topics envisaged, each of them being conducted by a Liaison centre.

The main purpose of this research network is to undertake joint applied research on sunflower, according to an accepted methodology, agreed division of tasks and timetable. The Network is also encouraging the undertaking of an exchange of experience and information among the interested institutions.

The first biennial cycle of activity (1976 and 1977) started with four research topics :

I. Experimentation of sunflower cultivars in competitive trials (Liaison centre : Research Institute for Cereals and Industrial Crops Fundulea, Romania).

II. Sunflower disease mapping in Europe (Liaison centre : National Research Centre for Oil Crops, INIA, Córdoba, Spain).

III. Chemical weed control in sunflower crops (Liaison centre: Interprofessional Technical Centre of the Metropolitan Oil Crops, CETIOM, Paris, France).

IV. Study on variability of fatty acids and tocopherols in sunflower oil (Liaison centre: Institute for the Application of Nuclear Energy in Agriculture, Veterinary Medicine and Forestry, INEP, Zeman-Belgrade, Yugoslavia).

Two new research topics have been added in the next biennial cycle (1978—1979):

V. Genetics of the main agronomic characteristics in sunflower (Liaison centre: Research Institutes for Crop Production, Ruzyně-Prague, Czechoslovakia).

VI. Sunflower response to irrigation under different environmental conditions (Liaison centre: National Research Centre for Oil Crops, INIA, Córdoba, Spain).

The reasearch programme for each topic, including objectives, methodology and experimental technique, has been worked out by the Liaison centres with the consultation of the participating institutions. On the basis of the experience gained in the first biennial cycle, the research methods and experimental technique have been improved, a better unity of ideas and interpretation of scientific results being achieved. To this accomplishment has largely contributed the visits performed by network and subnetwork co-ordinators, as well as the second consultation meeting of Sunflower Network organized at Córdoba, Spain, between 23—26 September 1977 and attended by 51 delegates representing different institutions from 15 countries.

At present, 42, institutions from 29 countries are members of Sunflower Network. Depending on the existing trained staff and facilities, each participating country has contributed to one or more research topics.

The scientific co-operation among the Network members is based on their voluntary contribution and has a flexible and experimental character and gradual development, according to the advances in the joint research activity.

Although initially intended to the European countries, the Network proposed itself from the very beginning to extend its activity and to other national institutions from the non-European countries interested in this type of co-operation, so that they could take advantage of the experience acquired, receive scientific information regularly and even participate to the common research programmes. In this way, institutions in developing countries can collaborate with those in countries of a higher technological level, in view of expanding their investigations and thus obtaining more rapidly the results which are so important for the agriculture development of their countries.

In the second biennial cycle, certain countries from Central or South America as Mexico or Argentina or from North Africa and Near

East as Egypt, Ethiopia, Sudan, Jordan, Iraq, Iran, Pakistan, have been accepted in Sunflower Network, most of them being interested in testing and identification of the best adapted sunflower cultivars.

The most active participation has been registered in the first subnetwork concerned with the experimentation of sunflower cultivars, showing the large interest manifested for the identification and extension of high yielding hybrids, as an important factor for increasing seed and oil yield.

A number of 22 hybrids and 3 open-pollinated varieties were tested in 20 locations from 16 countries in the first experimental cycle. In the second biennial cycle, 20 single and threeway hybrids and 11 open-pollinated varieties are being experimented in 38 locations from 25 countries. Sunflower hybrids included in trials are the most recent achievements of breeders from Bulgaria, France, Romania, Spain, U.S.A. and Yugoslavia and most of them are obtained on cytoplasmic male sterility basis and contain genes for resistance to downy mildew.

The co-operation for mapping sunflower diseases in Europe has included 14 institutions from 12 countries. The National Research Centre for Oil Crops Córdoba, Spain, has initiated the collection of information data on disease survey methods in use in the various countries and the diseases already recognized as a basis for a generally acceptable methodology to be used by all participants in the mapping project. In a first phase, all the diseases which have been recorded or observed on sunflower in Bulgaria, France, Hungary, Poland, Romania, Spain, Turkey and Yugoslavia have been listed, indicating the frequency and the intensity of the attack, as well as the economic consequences. In a subsequent phase, the mapping of each disease separately, by countries, was initiated, indicating the main sunflower areas and the distribution of each disease, so that a separate comprehensive map showing all the countries can be prepared later for each disease. Detailed maps of the main sunflower diseases have been prepared by the participating institutions from Bulgaria, France, Romania, Spain, Yugoslavia.

A number of 16 experiments were conducted by 9 institutions from 8 European countries within the frame of the subnetwork concerned with chemical weed control in sunflower. The Liaison centre, CETIOM Paris, compiled a list of the chemicals utilized or under testing in France, Italy, Poland, Spain, Sweden, Romania, and Yugoslavia, as well as a preliminary list of the main weeds of sunflower crops, indicating the order of importance in which they are situated. 41 simple or combined herbicides have been utilized in pre-plant incorporation, pre-emergence, post-emergence or in double treatment, in production fields or on experimental plots.

The diversity of situations- flora, soil, climate, and of results obtained in each country, is evident. The list of the authorized herbicides is being completed, indicating their main characteristics as concerns doses, stage of utilisation, efficacy and selectivity, so that it could serve as a guide to all investigators for solving the local, specific problems.

The fourth subnetwork, based on oil quality investigation, has used seed samples taken from sunflower trials conducted cooperatively by the member countries. Starting from 1978, protein quantity and quality has been also investigated in these samples by the Research Institute for Fodder Crops of Iregszemcse, Hungary.

The new research topic "Genetics of the main agronomic characteristics in sunflower" is suitable for a co-operative study programme, each participating institution having to investigate a certain aspect of the subject. The final aim is to work out a morphological and physiological ideotype of a high yielding sunflower cultivar, with high oil content and good resistance to diseases, adapted to a specific environment.

The recent investigations concerning sunflower response to irrigation under different environmental conditions aim at making clear to what extent sunflower plants use the irrigation water efficiently and which are the geographic zones where irrigation is profitable.

The promising results obtained in the first biennial cycle of research activity as well as the great interest aroused by this type of international scientific co-operation constitute a premise of future remarkable successes in the development of scientific researches in sunflower and thus contributing to fulfilment of the present desideratum of the mankind to increase the agricultural production and enhance the food resources.

L'ORGANISATION ET LES OBJECTIFS DU RÉSEAU F.A.O. DE RECHERCHE SUR LE TOURNESOL

Résumé

Le Réseau F.A.O. de recherche sur le tournesol a été fondé en octobre 1975 à Bucarest, ayant comme centre de coordination l'Institut de Recherches pour Céréales et Plantes Industrielles de Fundulea, Roumanie. Le réseau est constitué de six sous-réseaux, chacun d'eux correspondant à un thème de recherche conduit par un centre de liaison. Le but principal du Réseau est d'effectuer des recherches appliquées

dans le domaine de la culture de tournesol, suivant une méthodologie commune et sur la base d'une division adéquate des devoirs. Ainsi, les recherches sont dirigées en premier lieu dans la direction de l'expérimentation des cultivars de tournesol et l'étude génétique des principaux caractères agronomiques qui conditionnent les hauts rendements en graines et en huile. De même, ont été développées les recherches communes concernant l'intensité et la fréquence des maladies du tournesol, le désherbage chimique, la réponse du tournesol à l'irrigation, la variabilité de la qualité de l'huile et des protéines du tournesol.

Quoique destiné au début aux pays européens, le Réseau s'est proposé dès sa fondation d'étendre son activité en dehors de l'Europe, ainsi qu'à présent il comprend 42 institutions de 29 pays de l'Europe, l'Afrique, le Proche et Moyen-Orient, l'Amérique du Nord et du Sud. De cette façon, les institutions dans les pays en voie de développement pourront collaborer avec ceux qui ont un niveau technologique plus élevé, en vue d'utiliser les résultats expérimentaux existants et de développer leurs propres recherches pour l'extension de la culture du tournesol et l'augmentation des rendements en graines et en huile.

ORGANIZACIÓN Y OBJETIVOS DE LA RED F.A.O. DE INVESTIGACIÓN DEL GIRASOL

Resúmen

La Red F.A.O. de investigación del girasol se estableció en el mes de octubre de 1975 en Bucarest, teniendo como centro de coordinación el Instituto de investigaciones para cereales y plantas técnicas de Fundulea, Rumanía. La red está integrada por seis subredes, cada una de ellas correspondiendo a un tema de investigación dirigida por un centro de relación. La meta principal de la Red es efectuar investigaciones aplicadas al dominio del cultivo del girasol, por medio de una metodología común y de una división correspondiente de las tareas. De este modo, las investigaciones están dirigidas primeramente a la experimentación de las variedades y los híbridos de girasol y al estudio genético de los principales caracteres agronomicos que condicionan las producciones altas de semilla y aceite. Al mismo tiempo, se han desarrollado las investigaciones comunes con respecto a la intensidad, frecuencia de las enfermedades, la manera de combatir las malas hierbas por vía química, la respuesta del girasol a la irrigación, la variabilidad de la calidad del aceite y de las proteínas del girasol.

Aunque inicialmente destinada a los países europeos, incluso desde el principio la Red se propuso extender su actividad también fuera de Europa, así que actualmente comprende 42 instituciones de 29 países de Europa, Africa, el Oriente Cercano y Medio, la America del Norte y del Sur. De este modo, las instituciones de los países en vía de desarrollo pueden colaborar con los de los países con un nivel tecnológico más elevado, en vista de utilizar los resultados experimentales existentes y de desarrollar las investigaciones propias para desarrollar el cultivo del girasol e incrementar las producciones de semillas y aceite.