

THE RESEARCH PROGRAMME FOR APPLIED GENETIC INVESTIGATIONS IN SUNFLOWER

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The genetic subnetwork was established at Córdoba, Spain, in September 1977, on the occasion of the second meeting of the F.A.O. Research Network on Sunflower. A consultation meeting was held afterwards (27—30 November 1978) at the Research Institutes for Crop Production of Ruzyně-Prague, designated as a liaison centre of this subnetwork, with the purpose of discussing and adopting its joint research programme. The meeting was attended by 18 researchers from 6 countries: Czechoslovakia (10), France (2), Poland (2), Romania (1), Spain (1) and Yugoslavia (2).

It was agreed upon the fact that the genetic investigation undertaken jointly by this subnetwork should be exclusively applied research works which would help sunflower breeders in their efforts of developing better sunflower hybrids, with high yielding capacity and good resistance to diseases, pests and unfavourable environmental conditions. The final aim is to work out a morphological and physiological ideotype of sunflowers, adapted to different environments, by studying genetically and selecting those model characters which are of a decisive importance in designing the ideal sunflower plant ideotype.

Such a complex scientific undertaking shouldn't be achieved without the joint efforts of those institutions which have the necessary qualified staff and equipment and a minimum tradition in genetic investigation. Taking into account these considerations, an adequate division of tasks has been envisaged and adopted, so that each participating institution will investigate a certain genetic aspect and will provide results and documentation to others. The liaison centre will corroborate the whole investigation, compiling all scientific data and information.

The following topics of sunflower genetics will be gradually approached:

1. Genetic bases of the most important elements of productivity.
2. Genetics of pollen sterility, restoration and disease resistance.
3. Genetics of marker characters.
4. Exchange of information on genetic research in sunflower.

The research team of topic No. 1 is represented by: Czechoslovakia (Ruzyně-Prague), France (Montpellier), Poland (Poznan), Romania (Fundulea) and Yugoslavia (Novi Sad).

The team for topic No. 2 is made up of the following countries: Czechoslovakia (Ruzyně-Prague), France (Clermont-Ferrand), Romania (Fundulea), Spain (Córdoba) and Yugoslavia (Novi Sad).

The activity stipulated for topics No. 3 and 4 will be performed by the research team of Ruzyně-Prague Institutes.

The main objectives of topic No. 1 are:

- Determination of the decisive yield components for different geographical regions of Europe.
- Adaptability of genotypes and yield component stability.
- Genotype-environment interaction and variability of the main characters.
- Ideotype of sunflower hybrid plant for different environments.

The experiment will consist of 7—12 inbred lines, the F_1 hybrids obtained from their diallel crosses, and the F_2 generations. Trials will be organised in 8 locations and in two experimental years.

The inbred lines which will be provided by different institutions, should display a high general combining ability and, if possible, re-

sistance to *Plasmopara helianthi*. In February 1979 the co-operating institutions will send seeds to Novi Sad and Fundulea Institutes, where diallel crosses will be performed.

The next meeting for analysing the results of this topic will be convened at Novi Sad, in the last quarter of 1980.

The objectives of topic No. 2 are :

— Phenotypic stability of pollen sterility and fertility restoration under different environmental conditions.

— Genetic variation of resistance to diseases in different geographical regions.

— Collection of various sources of pollen sterility, fertility restoration and resistance to diseases.

— Cytological, histological and biochemical analyses of different sources of pollen sterility and resistance to diseases.

The sources of pollen sterility and fertility restoration will be collected at Clermont-Ferrand (France) and the collection of genes for resistance to diseases will be organized at Novi Sad (Yugoslavia). Afterwards, a limited number of lines or sources, of different genetic origins will be studied in an international experiment, starting from 1982. This experiment will be carried out by the same 8 institutes which are involved in topic No. 1.

Cytological, histological and biochemical analyses will be performed at Ruzyně-Prague and by an institution studying biochemistry of pollen sterility in France. The next consultation on the problems of topic No. 2 will be organized at Fundulea, in the last quarter of 1980.

The objectives of topic No. 3 are :

— Description of morphological traits already used, or potentially useful as markers.

— Heredity of marker characters.

— Detection of linkage between different genes and chromosome mapping.

— Organization of a large collection of lines with marker genes.

The first stage of this study which will be performed at Ruzyně-Prague, consists of the identification of those traits which already are, or could be markers. This survey will include a description of these characters and their genetic control. A card index of markers will be prepared.

In the second stage, starting from 1981, seeds will be collected for making a longstored collection of marker lines at Ruzyně-Prague Institutes. A large hybridologic study will be developed for determining linkages between different marker genes.

The co-operation for topic No. 4 will be aimed at :

— Publication of an abstract index of papers or printed works on sunflower genetics, breeding, biology and phytopathology.

— Organization of a library with genetic sunflower reprints of publications issued after 1970.

— Periodical exchange of papers among the countries involved in subnetwork co-operation.

In order to accomplish this goal, each country will send regulary, copies from all their publications on sunflower genetics, breeding, biology and phytopathology to the liaison centre of Prague. Papers older than 1970 will be sent to Ruzyně-Prague in 1979, as reprints or xero-copies. All the collected reprints will be xeroxed and sent to all the participants in co-operation, twice a year.

The results of Sunflower genetic subnetwork will be distributed to all participants involved in this co-operation and to other members of the F.A.O. Research Network on Sunflower. They will be published also in the Information Bulletin of the F.A.O. Research Network on Sunflower or in "Sunflower Newsletter" edited by the International Sunflower Association.

Sunflower genetic subnetwork is open to all institutions interested in such investigations or which need genetic support for the development of their sunflower breeding programmes.

LE PROGRAMME DE RECHERCHES SUR LA GÉNÉTIQUE APPLIQUÉE DU TOURNESOL

Résumé

Le sous-réseau de génétique a été constitué à Cordoue, Espagne, en septembre 1977, à l'occasion de la seconde réunion du Réseau F.A.O. de recherche chez le tournesol. En novembre 1978 à Prague, Tchécoslovaquie, où se trouve le centre de liaison du sous-réseau, a eu lieu une réunion de travail des six pays participants : Espagne, France, Pologne, Roumanie, Tchécoslovaquie, Yougoslavie.

Les investigations qui seront effectuées en commun seront exclusivement des recherches de génétique appliquée, destinées à aider les améliorateurs dans leurs efforts de créer des hybrides supérieurs de tournesol, à haut rendement et avec une bonne résistance aux maladies et à des conditions de milieu défavorables. Le but final est de mettre au point un ideotype morphologique et physiologique de tournesol, par des investigations de génétique et par la sélection des caractères modèle qui sont d'une grande importance dans la construction d'un ideotype idéal de plante.

Les thèmes suivants seront abordés graduellement : la génétique des principaux éléments de productivité, l'hérédité de la stérilité et de la restauration du pollen, la génétique de la résistance aux maladies, l'étude et l'utilisation des marqueurs génétiques chez le tournesol.

Le sous-réseau de génétique est ouvert à toutes les institutions intéressées dans ces recherches ou qui ont besoin d'assistance génétique pour développer leurs propres programmes d'amélioration du tournesol.

PROGRAMA DE INVESTIGACIONES DE GENÉTICA APLICADA AL GIRASOL

Rcsúmen

La subred de génética fue constituída en Córdoba, España, en septiembre de 1977, con la ocasión de la segunda reunión de la Red F.A.O. de investigación para el girasol. En noviembre de 1978 se celebró en Praga, donde se halla el centro de relación de la subred, una reunión de trabajo de los seis países participantes : España, Checoslovaquia, Francia, Polonia, Rumanía y Yougoslavia.

Las investigaciones que se efectuarán en común serán exclusivamente investigaciones de genética aplicada, destinadas a ayudar a los mejoradores en sus esfuerzos para crear híbridos superiores de girasol, con capacidad elevada de producción y buena resistencia a enfermedades y a condiciones ambientales adversas. La meta final es proyectar un ideotipo morfológico y fisiológico de girasol por medio de investigaciones genéticas y por la selección de aquellos caracteres modelo que tienen una importancia fundamental en la construcción de un ideotipo morfológico y fisiológico de girasol por medio de investigaciones genéticas y por la selección de aquellos ca-

racteres modelo que tienen una importancia fundamental en la construcción de un ideotipo ideal de planta.

Los siguientes temas se abordarán gradualmente: las bases genéticas de los principales elementos de productividad, la hereditad de la esterilidad y de la fertilidad del polén, la genética de la resistencia a enfermedades, el estudio y la utilización de los caracteres marker al girasol.

La subred de genética está abierta para todas las instituciones interesadas en estas investigaciones o que necesitan una orientación genética para el desarrollo de sus propios programas de mejora del girasol.