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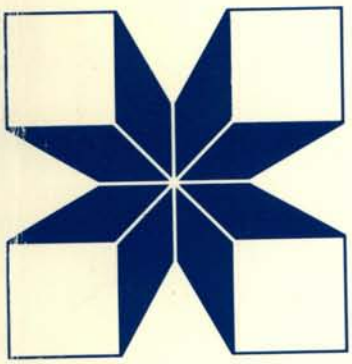

CANADA

# OIL CROPS:
# PROCEEDINGS OF THE THREE MEETINGS HELD AT PANTNAGAR AND HYDERABAD, INDIA, 4 – 17 JANUARY 1989

The International Development Research Centre is a public corporation created by the Parliament of Canada in 1970 to support research designed to adapt science and technology to the needs of developing countries. The Centre's activity is concentrated in six sectors: agriculture, food and nutrition sciences; health sciences; information sciences; social sciences; earth and engineering sciences; and communications. IDRC is financed solely by the Parliament of Canada; its policies, however, are set by an international Board of Governors. The Centre's headquarters are in Ottawa, Canada. Regional offices are located in Africa, Asia, Latin America, and the Middle East.

Le Centre de recherches pour le développement international, société publique créée en 1970 par une loi du Parlement canadien, a pour mission d'appuyer des recherches visant à adapter la science et la technologie aux besoins des pays en développement; il concentre son activité dans six secteurs : agriculture, alimentation et nutrition; information; santé; sciences sociales; sciences de la terre et du génie et communications. Le CRDI est financé entièrement par le Parlement canadien, mais c'est un Conseil des gouverneurs international qui en détermine l'orientation et les politiques. Établi à Ottawa (Canada), il a des bureaux régionaux en Afrique, en Asie, en Amérique latine et au Moyen-Orient.

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**This series includes meeting documents, internal reports, and preliminary technical documents that may later form the basis of a formal publication. A Manuscript Report is given a small distribution to a highly specialized audience.**

**La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.**

**Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.**

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1. The Brassica Subnetwork-II
2. The Other Oil Crops Subnetwork-I
3. The Oil Crops Network Steering Committee-I

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# CONTENTS

## Part 2. Other Oilcrops Subnetwork-I

## Part 3. Oilcrops Network Steering Committee-I

# THE RAPESEED (*Brassica napus* L.) QUALITY BREEDING PROGRESS IN SHANGHAI ACADEMY OF AGRICULTURAL SCIENCES (SAAS) FOR RECENT YEARS

Sun Chaocai

Rapeseed (*Brassica napus* L.) is the main oil crop in the suburbs of Shanghai. Shanghai is one of the highest rapeseed producing regions in China. The rapeseed growing area has gradually increased and the seed yield is stable in recent years, Table 1. Our government began to pay great attention to study the improvement of rapeseed quality at the end of 1970.

Table 1. The rapeseed area and yield in Shanghai

| Year | Area (ha) | Yield (kg/ha) |
|---|---|---|
| 1981 | 63,730 | 2,047 |
| 1982 | 63,160 | 2,355 |
| 1983 | 52,750 | 1,785 |
| 1984 | 49,740 | 2,303 |
| 1985 | 70,670 | 2,010 |
| 1986 | 80,730 | 1,890 |
| 1987 | 80,000 | 2,099 |
| 1988 | 85,330 | 2,198 |

The rapeseed quality breeding program, which started in SAAS in 1981, has been supported by the Canadian International Development Research Centre (IDRC) since Oct. 1983. Three high-quality rapeseed strains have been developed and put in to Shanghai's and national region tests since 1983. With the development of new strains, the seed yield has increased gradually, Table 2.

Table 2. Change of yield among three high-quality rapeseed strains from 1983 to 1988

| Strain | Time | Check + % | Quality |
|---|---|---|---|
| 2524 | 1983-1985 | -(25-35) | 0+ |
| 24016 | 1985-1987 | -(15-25) | 00 |
| 8701 | 1987-1988 | +5-(-5) | 0+ |

A single-low rapeseed strain has been put in both Shanghai's tests, national rapeseed variety region tests and production tests in 1989. Four-single low and two double-low rapeseed strains have entered the multi-location tests. Thirteen single-low and seven double-low strains have been placed in the strain yield tests. We are sure that more new strains, which possess better agronomic characters, quality and higher seed yield than the popularized varieties are being put in the Shanghai's or national region tests so that they become high-quality commercial varieties.

Virosis and Sclerotina in rapeseed are two main diseases which severely affect the seed yield and quality in the suburbs of Shanghai. Disease resistant rapeseed breeding started in SAAS in 1960's. With the development of the research on rapeseed quality breeding, disease resistant rapeseed breeding is more and more important for increasing seed yield and improving quality. It was in 1983 that SAAS started to screen and evaluate parent materials of rapeseed (*B. napus* L.) with virosis resistance. A total of 866 materials were inoculated artificially in the greenhouse and infected naturally in the fields for evaluation. Some resistant strains and plants have been obtained through selection and evaluation over several years; for example, "Xuan 35" and "81-23". The solid foundation has been laid for virosis resistant rapeseed breeding. SAAS cooperates with the University of Manitoba to screen and evaluate the resistance to Sclerotinia.

SAAS conducted research on rapeseed anther culture in 1985. The laboratory for rapeseed tissue culture has been set up with the financial aid from Canadian IDRC. The anther culture technique has been combined with the rapeseed

quality breeding. Hybrid progenies of 39 different cross combinations have been anther-cultured for a few years. Five hundred fifty anther derived plantlets survived after transplant. They were doubled to diploid plants and normally set seeds. In autumn of 1988, 50 anther-derived materials were planted in hybrid nursery for field selection. More hybrid progenies are to be anther-cultured in 1989.

The cycle of frozen chamber vernalization, growth room, greenhouse and field has been set preliminarily and put into use. The first generation of 22 cross combinations passed vernalization in frozen chamber and produced seeds normally in the growth room in the summer of 1988. We have invented a good condition to speed up alteration of rapeseed generations and breeding.

As an important aspect of rapeseed quality breeding, it is necessary to enhance the precision of the quality assay technique. Under the financial aid from IDRC and the investment from our government, SAAS has set up a testing centre and a chemistry laboratory which can fit the rapeseed quality breeding. Several techniques for analysis on the main quality indices have been introduced, developed and studied in rapeseed. The centre and the laboratory have been equipped with 2 gas chromatographs, 1 nuclear magnetic resonance, 1 HPLC, 1 infrared spectrophometer, 1 high-speed cryocentrifuge and cryo-refrigerator, 1 KDM-01 nitrometer, 1 electronic analysis balance and other precision instruments. The preliminary and precise analyses procedures for erucic acid and glucosinolate have systematically been established. Study on modification of UV thiourea and of infrared spectrophotometric has been finished for the analysis of glucosinolate content in meal. TMS method has been studied and modified. Thymol method has been introduced. We cooperated with other Chinese institutions to study and fulfil the standard method of analysis of erucic acid content in oil; and held a few training courses on rapeseed quality analysis. Many technicians were trained with good result.

During Sino-Canadian rapeseed breeding project, Canadian IDRC offered scholarship for three M.Sc. pursuers from SAAS and accepted two visiting scholars. Three graduates are studying for Ph.D. in Canada. Canadian scientists sent by IDRC came to Shanghai to give lectures on rapeseed breeding, virosis and biological technique. Ninety one Chinese rapeseed breeders and technicians attended them. We also held training courses on rapeseed quality analysis and knowledge of designing field tests, observing and recording growth stages and agronomic characters of rapeseed varieties. Fourteen technicians engaged in rapeseed quality analysis and many technicians coming from the suburbs of Shanghai attended them. Owing to this foundation, we have established four places (including SAAS) for multi-location tests, three places for production tests, two places for performance tests and one place for stock seed production. A cycle from rapeseed breeding to production has preliminarily been formalized in Shanghai.

As we mentioned above, the rapeseed quality breeding in SAAS is stably put forward under the financial aid from Canadian IDRC and the investment from our government. We, here, would like to express our sincere appreciation to Canadian IDRC. We truly hope to enhance and develope the cooperation with Canadian IDRC and member countries of International Oil Crops Network in other fields of rapeseed improvement.