# OIL CROPS: BRASSICA SUBNETWORK

## PROCEEDINGS OF THE THIRD WORKSHOP, QUALITY TRAINING, AND CHINESE PROJECT REPORTS, HELD IN SHANGHAI, PEOPLE'S REPUBLIC OF CHINA, 21–24 APRIL 1990

ABBAS OMRAN

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# Oil Crops: Brassica Subnetwork

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# *GOALS FOR 1989-1991 AND PROGRESS OF THE BARANI AGRICULTURAL RESEARCH AND DEVELOPMENT PROJECT (BARD) IN PAKISTAN, PERTAINING TO BRASSICA.*

*Hans Henning Muendel*

BARD is a Pakistan-Canada cooperative project, headquartered at the National Agricultural Research Center (NARC) in Islamabad, for research and development in mainly rainfed (Barani) areas. The Pakistan Agricultural Research Council is the Pakistani partner; and the Canadian International Development Agency (CIDA) is the Canadian partner, with Agriculture Canada being the executing agency on behalf of CIDA.

The project was initiated in 1982 and is due for completion, with phase-in to the NARC, by June 1991. One of the major crop development thrusts is on the rapeseed/mustard complex. The main emphasis here is on canola-quality, variety introduction, testing and breeding.

For the rapeseed/mustard component of BARD, our work is organized towards the following seven goals, with current developments briefly indicated:

1. **To identify early-generation and advanced lines of *Brassica napus*, low in erucic acid (<5%) and glucosinolates (<40 μmoles/g), earlier maturing and/or higher yielding than Westar and at least equal to Ganyou-5 (Pak-China 88); and to generate backcrosses of high oil and high yielding lines with canola-quality parents.**

Eighty-one advanced-generation lines are planted in preliminary yield trails, being harvested from late April to early May. A summer nursery in the hills (at Kaghan) was used to select the parental lines.

2. **To coordinate the National Uniform Rapeseed/Mustard Yield Trial (NURYT); Include BARD-developed 'canola'-quality *B. napus* lines selected from preliminary yield tests, as well as 'canola'-quality lines from NARC and other centers, and introductions from abroad.**

This 16-entry test is grown at 11 locations throughout Pakistan and Azad Jammu/Kashmir, from high rainfall locations and irrigated fields to commonly very dry locations. Eight of the entries are from the BARD-breeding program; three are introductions from Australia (Shiralee, Maluka and Tatyoon), one introduction from Canada (Westar, the current 'canola' standard used by BARD); two introductions from Sweden (one very early, short and upright, the other late but also very upright); Ganyou-5 (a non-canola introduction from China, released last year for its high yield in the North West Frontier Province); and a local non-canola check, DGL.

3. **To convene the Annual Technical Program and Work Planning Meeting of Rapeseed/Mustard Scientists in Pakistan. Organize a Rapeseed/ Mustard Travelling Seminar.**

Twenty-nine scientists from 14 establishments throughout the country participated in the August 29-30, 1989 Annual Technical Program and Work Planning Meeting.

From 25 to 30 scientists participated in the week long Fourth BARD Rapeseed/ Mustard Travelling Seminar, held from March 4 to 10, 1990. Research institutes, farmers' fields, seed fields and processing facilities of the Punjab Seed Corporation, oil crushers, solvent extraction and refining factory, soap manufacturing plant - all in Punjab Province - were some of the stops on our way.

4. **To increase production of seed 'grown-from' Westar in Punjab and NWFP through contract research, maximization and outreach programs and in cooperation with the Agronomy Component, at O.R. sites.**

For the 1989/90 rabi season, approximately 130 ha were seeded for this 'canola' outreach, with seed supplied or sold from BARD.

**5. To determine diverse optimum agronomic practices related to weed control, fertilizer use and planting dates, for effective rapeseed/mustard production:**

**5.a. Determine effective and economical dose of herbicides for the control of broadleaf and grassy weeds in rapeseed/mustard.**

Application of 0.5 l/ha of Fusilade gave good results for annual and perennial grassy weed control. Use of Treflan increased *Brassica* yields.

**5.b. Determine most economical dose of fertilizers (N & P) for optimizing yield in rapeseed and mustard under Barani and irrigated conditions.**

Two years' data indicate that 100 N and 30 P kg/ha broadcast, followed by 75 N and 30 P kg/ha side-banded at seeding, gave best results.

**5.c. Determine the effect of planting date on yield of *Brassica* species.**

Mid-October plantings, in the Islamabad area, gave the highest yields.

**6. To promote the production of canola oil from production of the crop on farmers fields. Encourage private industry involvement in the procurement and processing of canola seed and the sale of canola oil.**

BARD purchased farmers' canola seed and arranged to have it crushed and refined commercially, both the 1987/88 and 1988/89 crops. In each case, around 13 tons of refined oil were available for sale through commercial stores and through the BARD project. Sales were made at farmers' field-days and various other fairs, open houses, etc. In the first year, questionnaires were given with each 2.5 L tin sold. As a refund, Rs 5 was assured for filled out questionnaires, a good return of over 1000 was achieved. Responses on use of the oil were overwhelmingly positive.

**7. To train Senior Scientific Officer in operation of a plant breeding program and two Senior Scientific Officers in rapeseed agronomy and extension.**

One person was sent for post-graduate studies to Saskatoon. One Ph.D holder was hired for becoming involved in the breeding aspects. One BARD Scientific Officer, along with another one from NARC, was sent to India for 4 weeks to attend *Brassica* breeding/agronomy training session sponsored by IDRC Brassica Sub-Network in December 1989. BARD is financially supporting Ph.D. studies of the same Scientific Officer, with the Oilseed Advisor being accepted by the Qaid-i-Azam University in Islamabad as Co-Advisor for the Ph.D program.

**8. To evaluate and provide supervision as Scientific Authority on research contracts with other agencies, funded by BARD.**

The Oilseed Advisor currently acts as Scientific Authority on seven contracts involving various aspects of rapeseed/ mustard research in three provinces.

The BARD Agricultural Engineering group, in collaboration with ourselves and the Farm Machinery Institute of NARC is involved in:

- modification of tillage and tractor-mounted seeding equipment for rapeseed/mustard: for improved stand establishment by improving furrow openers, packing wheels and delivery systems; and
- procuring and evaluating rapeseed reaping and threshing equipment (e.g. refer to experimental/small plot reaper from Swift Machine and Welding Ltd.)

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