

LINKING RESEARCH AND MARKETING OPPORTUNITIES FOR PULSES
IN HET 21ST CENTURY

Current Plant Science and Biotechnology in Agriculture

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The book series is intended for readers ranging from advanced students to senior research scientists and corporate directors interested in acquiring in-depth, state-of-the-art knowledge about research findings and techniques related to all aspects of agricultural biotechnology. Although the previous volumes in the series dealt with plant science and biotechnology, the aim is now to also include volumes dealing with animals science, food science and microbiology. While the subject matter will relate more particularly to agricultural applications, timely topics in basic science and biotechnology will also be explored. Some volumes will report progress in rapidly advancing disciplines through proceedings of symposia and workshops while others will detail fundamental information of an enduring nature that will be referenced repeatedly.

The titles published in this series are listed at the end of this volume.

Linking Research and Marketing Opportunities for Pulses in the 21st Century

*Proceedings of the Third International Food Legumes
Research Conference*

Edited by

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About the Conference

The Third International Food Legume Research Conference (IFLRC III) was held at the Convention Centre in Adelaide, South Australia from the 22 to 26 September 1997. The two previous conferences had dealt with the crops, pea (*Pisum sativum*), lentil (*Lens culinaris*), faba bean (*Vicia faba*) chickpea (*Cicer arietinum*) and grasspea (*Lathyrus sativus*). Included with these crops in IFLRC III were the lupins (*Lupinus angustifolius*, *L. albus*, and *L. mutabilis*).

The title of the conference “*Linking Research and Market Opportunities for the 21st Century*” was indicative of the need, felt by many persons, that to ensure continued support from governments and funding organisations it was essential to illustrate that the research being undertaken on pulses was aimed at increasing yields and the financial return to farmers. In many countries the food legumes are perceived to warrant less support than the cereals, a perception that has arisen as a result of the considerable improvements in yield achieved in the cereals and by concerns for food sufficiency in the face of increasing populations. The advantages of including food legumes in rotations and their role in human and animal diets are often overlooked by those allocating resources for research.

Many of the food legumes are also used as feed for animals. It is fortunate these alternative uses are available as it provides a secondary and at times a more important market for the production of the crop. Lupins in Australia are an example. Lupins have been included in rotations partially because of the benefit they confer to following cereal crops but at the present time most of the production is used as animal feed. IFLRC III included the research on grain legumes as feed for ruminant and monogastric animals and also as a feed in the expanding aquaculture industries. Additionally in the conference there were papers on the use of pulses in industrial processes, a use which is likely to increase in the future.

There were 14 sessions of invited and presented papers and a final session with summaries of the conference. In addition there were poster papers submitted by participants. These papers were accepted by the conference organisers provided the legume species and the topic of the poster were relevant to the aims of the IFLRC. Mid-way through conference a day of visits to farms and research stations was arranged to illustrate local production and research on grain legumes.

Near the end of the conference a paper prepared by Professor R J Summerfield and Dr F J Muehlbauer was delivered by Professor Summerfield on the ‘Continuation of the IFLRC’. In the paper they outlined the history of the IFLRCs and their past and future organisation. Because of its comprehensive coverage the paper serves as a very good Introduction to the Adelaide conference and I have arranged for it to be printed at the beginning of these proceedings.

Every conference hopes to expand on the strengths of previous conferences. The possible changes for the next conference are included in the paper.

Also listed are the financial donors whose generous support made the conference possible and the members of the various committees who made every effort to make the Adelaide Conference a success.

International Food Legume Research Conference : concept and continuity

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Retrospect : the Concept

The genesis of the concept of an *International Food Legume Research Conference (IFLRC)* can be traced to an informal meeting in 1983. Those present on that evening in Aleppo, Syria (viz. H.L.Blain, G.C. Hawtin, F.J. Muehlbauer, A.E.Slinkard, and R.J. Summerfield) were keen to ensure that national crop improvement efforts devoted to the food legumes should not be wasteful of resources by duplicating work ongoing elsewhere. A particular concern was to build on the then unprecedented efforts in food legume research underway at ICRISAT and at ICARDA, and which had begun in 1972 and 1976, respectively. These motives were in time to be articulated as the general objective of the IFLRC, viz.:

To build communication linkages in order to promote research collaboration and the interchange of scientific and technical information on a global basis covering all aspects of research and development of cool season food legumes.

The inaugural IFLRC became a reality in July 1986 when, under the guidance of Drs R.H. Lockerman and D.F. Bezdicsek, the combined efforts of an International Advisory Board, an International Observer and an Organizing Committee came to fruition (see Summerfield, 1988).

The four hundred or so delegates from 48 countries who attended IFLRC I in Spokane, Washington, USA participated in a series of pre-planned business meetings. By their votes the delegates endorsed both the general and specific objectives of the Conference as recommended by the organizers. Activities of the IFLRC as well as the composition and functions of an International Steering Committee were also agreed with enthusiasm. These details are summarized below.

Specific Objectives of the IFLRC

- To promote research collaboration and the integration and dissemination of knowledge on cool season food legumes;
- To provide an international forum for discussion on priority problem areas requiring research attention;
- To maximise awareness and use of novel technologies and research methods;
- To encourage the evaluation and adoption of appropriate new technologies on the farm;
- To provide an international forum for promoting links between institutions with the aim of strengthening research manpower development; and
- To promote awareness of the importance of cool season food legumes among scientists, policy makers and funding agencies in order to stimulate increased research attention and financial support.

Activities of the IFLRC

The principal activity will be the International Conference to be held approximately every four to five years. Other activities may be undertaken as agreed upon by the IFLRC.

Function of the International Steering Committee

- To ensure continuity and help minimize duplication among other national and international meetings;
- To assist the host organization with logistic arrangements for the Conference;
- To formulate the Conference agenda so as to meet the objectives of the IFLRC;
- To solicit financial and logistic support from donors and other organizations for IFLRC activities; and
- To undertake any other activities approved by the IFLRC in line with Conference objectives.

Proposed Composition of the International Steering Committee

- Representative from ICARDA;
- Representative from ICRISAT;
- Chairperson of the immediate past IFLRC;
- Program Chairperson of the immediate past IFLRC;
- Host nation Chairperson (to be co-opted, once known); and
- Seven representatives from six agro-geographical regions as defined by the Food and Agriculture Organisation of the United Nations, viz.:

Agro-Geographical Regions

I.	North America	USA and Canada
II.	Latin America and the Caribbean	Mexico; C. and S. America; Caribbean
III.	Europe	W. and E. Europe; USSR*; Israel
IV.	Africa	All African countries south of the Sahara
V.	Near East	N.Africa; West Asia to Afghanistan
VI.	Asia and the Pacific (including Pakistan)	India to China and Japan; Australia;
	(Two representatives)	New Zealand and Oceanic Isles

(*Now the Commonwealth of Independent States)

April 1992: the Second IFLRC

During the decade which began in 1983, the use of cool season pulse crops as food and feed continued to increase, to the extent that demand exceeded supply in most countries in the West Asia and North Africa region (Oram and Belaid, 1990). It is the poorest countries, the urban poor, rural peoples and farm families that suffer most in these circumstances. Given these sorts of impetus and causes for concern, the second IFLRC was in the event to be appropriately timed and appropriately located. The International Steering Committee (ISC) elected in Spokane voted Cairo as the venue for IFLRC-II. Under the guidance of Drs A.E. Slinkard and M.C. Saxena, the ISC worked *in tandem* with the Organizing Committee to plan the Conference for April 1992. More than 200 delegates came from 38 countries to ensure “another Major success” [see Roberts (1994), pp. 983-988 in Muehlbauer and Kaiser (1994)].

Business of the IFLRC was conducted following agreed procedures. A ballot proved heavily in favour of the *Continuation of the IFLRC Concept* and a new ISC was voted into being.

Continuity: the IFLRC-III

The newly-elected ISC (Table 1) met for the first time on 16 April 1992. Dr F.J. Muehlbauer and Professor R.J. Summerfield were elected as Conference Chairman and Program Chairman, respectively. The Committee agreed that IFLRC-III should take place during 1997 and noted that bids to host the Conference were anticipated from:

- ◆ The European Association for Grain Legume Research (J. Picard);
- ◆ General Directorate of Agricultural Research, Turkey (I. Kusmenoglu);
- ◆ Indian Council of Agricultural Research (P.N. Bhal); and from an
- ◆ Australian Consortium of Food Legume Scientists (R.O. Rees).

As intended, the ISC had completed the voting procedures necessary to decide the location of IFLRC-III by the Spring of 1993: by unanimous vote the Conference would be held in Adelaide, Australia.

Table 1. Members of the International Steering Committee for IFLRC-III

Region	Representative	Region	Representative
1. North America	Dr F.J. Muehlbauer (Chair) USDA-ARS Washington State University, USA	2. Latin America; Caribbean	Dr J.U. Tay INIA, Chile
3. Europe	Professor R.J. Summerfield The University of Reading, UK	4. Africa (sub-Sahara)	Dr G. Bejiga Crop Science Department, Ethiopia
5. Near East	Dr H.M. Halila INRAT Tunisia	6. Asia & Pacific (inc. Pakistan)	Dr B.A. Malik NARC, Pakistan
Immediate Past Program Chair	Dr M.C. Saxena ICARDA, Syria	6. Asia & Pacific (incl. Pakistan)	Mr R.O. Rees ABARE, Australia
Immediate Past Chair	Dr A.E. Slinkard University of Saskatchewan Canada	ICARDA Representative	Dr W. Erskine ICARDA, Syria
ICRISAT Representative	Dr Y.L. Nene ICRISAT, India	Co-opted by invitation	Dr W.J. Kaiser USDA-ARS-RPIS Washington State University, USA

Adelaide, Australia : 19-26 September 1997

Mr Brian Hansen (Primary Industries, South Australia) was co-opted onto the ISC as the Chairman of the Local Organising Committee (LOC) - the composition of which is given in Table 2.

Table 2. Members of the Local Organizing Committee for IFLRC-III⁺

Name	Organization
Mr B. Hansen	Primary Industries SA
Dr R. Knight*	University of Adelaide
Mr T. Day	Pulse Australia
Mr R. Rees	Primary Industries SA
Mr J. Hannay	Primary Industries SA
Mr W. Hawthorne	Primary Industries SA
Dr A. Dubé	SARDI, Adelaide
Mr R. Bulfield	Sapro Marketing Pty Ltd

⁺Dr J. Hamblin and Mr H. McClelland also provided enthusiastic support.

*Appointed as Editor of the Proceedings, once again to be published by Kluwer Academic Publishers, The Netherlands (Knight, 1998).

A particular concern for IFLRC-III was the linking of research activities and priorities with future market opportunities and demands - hence the subtitle "*Linking Research and Market Opportunities for the 21st Century*". The ISC, acting primarily through the efforts of the Conference and Program Chairmen (who visited Australia in March 1995 as the guests of CLIMA and the South Australia Department of Agriculture), agreed the following general objectives:

- (i) Plenary sessions would address world and regional production and consumption. Other sessions would consider research concerned with breeding and varietal selection, integrated pest management, nutritional value of pulses as food for humans and feed for animals, plant architecture, biotechnology, crop protection, sustainability, farming systems, modelling and germplasm.
- (ii) The marketing sessions would consider the quality and quantity of food legumes being produced, global and regional trends in supply and demand, the impact of government policies, innovations in processing and marketing, developments in the international supermarket trade and innovative pulse products.
- (iii) Poster papers would be presented during the Conference in what is a magnificent Adelaide Convention Centre Exhibition Hall.

In the event more than 200 co-authors contributed to the 70 or so invited papers and 176 posters were displayed. More than 400 delegates came from 39 countries to hear what was said and to see the information on display.

Discussion sessions were wide-ranging and stimulating. Conference administration, orchestrated by Mr R. Bulfield and his SAPRO Marketing team, was flawlessly efficient. There is no doubting that IFLRC-III, which opened with generous praise from the Honourable Rob Kerin MP (Minister for Primary Industries, SA), was a resounding success.

The ISC and the LOC are very pleased to record once again our sincere thanks to the several generous sponsors on whose support the financial viability of the Conference was so crucially dependent (Table 3).

Table 3. Sponsors of the IFLRC-III

PRINCIPAL SPONSORS
Primary Industries South Australia Grains Research & Development Corporation (GRDC) Centre for Legumes in Mediterranean Agriculture (CLIMA)
MAJOR SPONSORS
Lief Grain PTY Ltd SA Research & Development Institute (SARDI) AusAid
OTHER SPONSORS*
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SA Grains Industry Trust Fund
 US Pea and Lentil Council
 Ward McKenzie
 Governments of Northern Territory, Queensland, Victoria and Western Australia

* The Conference Organisers also thank Ansett Australia and Malaysia Airlines for their co-operation with arrangements for the domestic and international travel for selected speakers.

THE FUTURE : IFLRC-IV

As in previous years, IFLRC business generated enthusiastic interest with keenly contested ballots for regional representations on the ISC for IFLRC-IV. The new Committee (Table 4) met for the first time on 26 September 1997 when Drs J. Hamblin (CLIMA) and W. Erskine (ICARDA) were proposed and unanimously elected to Conference Chairman and Program Chairman, respectively.

Table 4. International Steering Committee for IFLRC-IV

Region ⁺	Representative
• Region 1	: B. Vandenberg (Canada)
• Region 2	: J. Tay (Chile)
• Region 3	: J. Wery (France)
• Region 4	: G. Bejiga (Ethiopia)
• Region 5	: B. Sakr (Morocco)
• Region 6	: J. Hamblin } (Australia)
	: B. Malik } (Pakistan)
• FAO Observer	: E. Kueneman (Italy)
• ICRISAT Representative	: W. Erskine (Syria)
• ICRISAT Representative	: N.P. Saxena (India)
• Immediate Past IFLRC Chair	: F.J. Muehlbauer (USA)
• Immediate Past IFLRC Program Chair	: R.J. Summerfield (UK)
• Chair, Local Organizing Committee	: To be coopted once known

⁺As in Table 1.

The Committee was pleased to record that two formal bids had been received from representatives of organisations in India and Turkey who wished to host IFLRC-IV in 2002. Both organisations have been requested to submit their final and formal bids in comprehensive detail by 30 March 1998.

Feed-back suggestions from IFLRC-III delegates were recorded for future reference, viz:

- (i) IFLRC-IV should target the cool season food legumes and any additional legume species of major regional importance depending on the geographical location of the Conference [e.g. if in Turkey, then possibly add *Phaseolus vulgaris*; if in India, then possibly add Asiatic *Vigna* spp; *Cajanus cajan* and *Arachis hypogaea*];
- (ii) Provide more time for viewing of posters;
- (iii) Include one or more Sessions targetting grain legume production for feed rather than food;

- (iv) Include a greater proportion of targetted research papers at the expense of general review papers and consider selecting topics from “offered” rather than “invited” papers;
- (v) Include broader sessions on biotechnological themes;
- (vi) Poster subjects can involve any specie of grain legume; and
- (vii) Offer awards for “*Best of*” categories, especially for younger scientists.

CONCLUDING REMARKS

The reality of the intervening decade or so since the first Conference in 1986 is that support for agricultural research in general and for that on cool season legumes in particular has declined. In the five years since the Cairo Conference this decline has accelerated not only for national programs in most countries but also at the international centres. Faced with declining support, the target of improving yields of the cool season food legumes by an average of 28 kg per hectare per year, so prominently mentioned at the Cairo Conference as required to meet the demands of an ever growing population in West Asia and North Africa, remains a daunting challenge in many regions. Nevertheless there have been exceptions to declining research support. The Centre for Legumes in Mediterranean Agriculture (CLIMA) has been established in Australia and there is strong federal and industry support provided to the national program in Canada. The scientific successes and on-farm impact of these two programmes are shining examples of the excellent return to investment in long-term research and breeding on cool season food legumes.

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Editorial Notes

Not all of the 72 papers presented at the conference are included in the proceedings, as the authors of 4 presentations did not wish to submit their papers for publication. Two contributions that were invited, but for different reasons were not presented, are included.

The format of units and numbers

The contributors to the proceedings come from different countries and have expressed numbers in different ways. To avoid confusion I have adopted a common format for the papers. I apologise to those for whom this format is not the one they use customarily.

The format I have followed is one used for text, written in the English language, in which digits to the left of the decimal point are marked off in groups of three with a comma or alternatively with a space. Numbers with decimals have the decimal point marked as a period (full stop) and not as a comma. The format is most easily illustrated by examples.

56,300 and 56 300 are ways of representing fifty-six thousand three hundred.

The yield 4.35 t/ha is four decimal three five tonnes per hectare

The units used throughout are metric and the abbreviation MT is a metric tonne.

Acronyms

Some international agricultural centres and some national centres have major programs of research on the crop species of interest to the IFLRC and have been frequently referred to in these proceedings by their acronyms.

They are

ICARDA International Center for Agricultural Research in Dry Areas, Aleppo, Syria

ICRISAT International Crops Research Institute for the Semi Arid Tropics, Patancheru, India

IPGRI International Plant Genetics Resources Institute, Rome, Italy

The Australian national organisations are

CLIMA Centre for Legumes in Mediterranean Agriculture, Perth, Australia

GRDC Grains Research and Development Corporation, Canberra, Australia

In the two previous proceedings the editors provided glossaries that defined terms such as accession, cultivar, genotype and germplasm. The definitions have not changed and therefore I have not presented them again in these proceedings. Anyone wishing to refer to these definitions will find them in the Editorial Notes and Glossary of *Expanding the Production and use of Cool Season Food Legumes* (eds FJ Muehlbauer and WJ Kaiser). 1994. Kluwer Academic Press.

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