GCIRC News

Global Council for Innovation in Rapeseed and Canola

"Building a World community for Innovation on Rapeseed and Canola"

N° 5, October 2019

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Editorial

New name, new logo!

This 5th issue of the GCIRC Newsletter will inform you on the post-congress news and events.

A major one being our new logo, chosen by the GCIRC board to realize the decision of the General Assembly to change of name and moto, as explained in the previous issue of this newsletter.

This 5th issue of the newsletter is the first occasion to show our new logo: we do hope that you will like it.

Beginning 2020, it will be on the homepage of our new website whose launching is expected for the new year.

Beyond reshaping the formal appearance of our association, "Building a World community for Innovation on Rapeseed and Canola" is a permanent effort for which everyone involved in rapeseed & canola research and innovation is involved, whatever his/her role in the GCIRC – the board, committees, as researcher, extensionist, etc…

The success of the 15th International Rapeseed Congress is a good indicator of the vitality of this world of research and innovation in Rapeseed and Canola: the concluding remarks of the congress by Prof Wolfgang Friedt duly record the progress made, highlight the challenges and open encouraging perspectives. Hope that we will go on with the innovation trend and see the results in 2023 in Sydney…

We welcome 12 new GCIRC members, which is also a very encouraging signal for this association, and we expect that many others will join GCIRC, for a better vision and development of rapeseed and canola research and innovation.

The GCIRC Executive Board

Activity/ News of the association:

The 15th International Rapeseed Congress, Berlin, June 16-19, 2019,

The 15th IRC was a real success regarding the quality and diversity of the communications and the participation of scientists from all regions of the world. The concluding remarks exposed at the end of the congress on June 19th by Wolfgang Friedt, President of GCIRC, offer an overview and remind us, 3 months later, of the top points of this memorable congress, and some notes about the life of GCIRC.

<<Ladies and Gentlemen,

First of all, I would like to thank you all for your valuable inputs and many different ways. I do hope that you have enjoyed the participation in the 15th International Rapeseed Congress as much as I did.

Please let me take the opportunity to recapitalize some highlights of the congress from my point of view.

Regarding the topics GENETICS, GENOMICS AND BREEDING, numerous approaches and technologies for investigating the OSR and Brassica genomes that did not even exist at the last congress have been established in recent years and are being applied. For example, the sequencing of long reads enabling the discovery of large and small scale genome structural variation in an unprecedented detail. This provides a great opportunity to understand chro-

mosomal rearrangements or cytoplasmatic evolution in the interest of trait improvement. If someone had told you that one would instantly sequence several hundreds and even up to over thousand entire genomes of the worldwide rapeseed collection one would probably not have believed it. This enormous data resource enables the community to push the Pan Genome approach forward, which creates an extremely powerful data source to unlock the secrets of trait inheritance. For sure, this information will be a solid base for further understanding the complex regulation of relevant traits. Especially at a time when sequence information is doubling every few months, I am sure that there is still much to expect from this scientific area in the future.

But the mere description of DNA information is not enough: only the link to traits, i.e. agronomic or quality characteristics will make all of the thousands of Terabyte sequence information useful. In this regard, it is good to see that the better understanding of plant genomes can make a significant contribution to breeding progress. Especially, contributions on understanding hybrid vigor, the development of heterotic pools and on the expansion of genetic pools and new ways of predictive breeding have been addressed.

A novelty that was already mentioned four years ago in Saskatoon but is now being implemented, targets the possibilities of genome editing. In the Mutagenesis and Genome Editing Session we have seen far-ahead possibilities for precise modification in unprecedented accuracy, even in polyploid species like wheat or rapeseed (see final keynote by Gaixa GAO). Although, these technologies can currently not be practically applied in Europe because of legal restriction, recent statements from various European countries to make a fresh start to adjust the “Genetic Engineering Act” give hope that local breeders may have access to these new opportunities in the future: Not only Breeders but also Farmers AND environment AND the whole society could benefit from such a change of setting.

Due to the attractiveness of the crop for farmers and industry and its strong extension in various regions, it also became attractive for all kinds of unwanted organisms living and feeding on the plant: So, DISEASES AND PESTS have gained undesirable importance in many growing areas. Therefore, the cultivation of oilseed rape is globally confronted with many challenges determining priorities of future rapeseed research and development.

Consequently, insect pests and fungal diseases are a serious threat for OSR today. Therefore, it is no surprise that more than one fourth of the contributed papers were submitted to this topic. Noteworthy, separate workshops have been organized in this field dealing with special pathogens and their control, i.e. blackleg, clubroot, and sclerotina. I would like to particularly

thank the organizers and also the participants of all workshops very much again for their outstanding activity.

At the same time, the issue of protecting beneficial organisms has become very important recently. So, it is all the more gratifying that the congress has concretely devoted itself to this question. The ideal way to control diseases and pests would be of course to protect beneficial organisms while still providing effective protection against yield limiting pests and diseases. And where there are problems, there are also possible solutions which may be roughly summarized in three categories:

i) Technological advancement for safer use of pesticides:

For example, the smart idea of applying pesticides by a dropleg nozzle shows that technologies for protecting the environment can be developed allowing a more sustainable application of agrochemicals. Therefore, chemical plant protection must not be ruled out in the future.

ii) With regard to the use of effective biocontrols and alternative coatings, this congress showed that the identification of such approaches have potential for future OSR production. Since not all techniques that seem promising in the laboratory would also work under field conditions and not necessarily make their way to practical application, such investigations of alternative agents are essential.

It was good to see that the idea of using beneficial fungi to prevent severe damage by clubroot and insects has been followed. To bring this forward a further and deeper understanding of microbe - or insect - to-plant interaction is clearly required; this topic will probably accompany us in the future.

iii) The best resistance strategy would be that the plant protects itself. Therefore, the exploitation and systematic use of plant genetic variation for resistance breeding has high priority: given that some of the pathogens, Verticillium for instance, cannot be cured by chemical agents and that there are declining chemical options for plant protection - particularly in the EU - it is urgently required to try and discover genetic determinants of resistance or tolerance which can be used in breeding for resistance to biotic stresses such as insect pests.

It has been a particular intention for the organizers to strengthen the topic AGRONOMY in the IRC 2019: this congress has probably been as much in context of climate change as no other congress before. The increasing frequency of extreme weather events makes us wonder whether and how rapeseed farming needs to be reshaped in the future. Although not every drought and every hot summer are attributable to climate change, on almost all continents weather extremes have increased and somehow caused yield losses. In addition, the

emergence of increasing environmental standards - taking the avoidance of nutrient (N) surpluses with their consequences on ecosystems and drinking water as an example – put further pressure on achieving high yield at justifying costs for environment. Several contributions on plant physiology, nutrition and challenges for crop management and a special workshop dealing with the management under environmental stress have improved our understanding for above and belowground plant architecture, and the development of specialized tissues under abiotic stress. In light of the fact that the strong breeding progress achieved without any doubts is not always reflected in yield on the farm level, it is quite important to rethink and reshape the way OSR is cultivated and integrated in crop rotations and how the management can contribute to convert the knowledge in higher yields and better products.
MUSTARD AND OTHER CRUCIFEROUS CROPS: another intention of the IRC has been the designation of a special session on mustards, reflecting their importance especially on the Indian subcontinent. I am not sure if this "experiment" can be considered as successful. Rather, it deserves further consideration e.g. by the organizers of the coming IRC.

Given the tremendous challenges for OSR but at the same time the overwhelming growth of knowledge leading to upcoming and useful technologies providing solutions one could never imagine before, make me strongly believe that in four years from now the 16th IRC in Sydney/Australia will become at least as interesting and inspiring as the last four days here in Berlin.
In view of the growing population and the increasing consumption, there is obviously a rising demand for products of oilplants like rapeseed. Therefore, OSR cultivation is expanding in various regions of the world, for example in eastern Europe and Russia. Nowadays, the crop is not just esteemed for its healthy seed-oil, but the RS meal is also a valuable compound as feed not only for ruminants such as dairy cows but – as we have learned in several talks on ANIMAL NUTRITION – is more and more used as a protein-rich feedstuff for monogastric animals such as pigs and poultry. The local demand for non-GMO protein in Europe further boosts this development.
In addition, the rapeseed protein may also become a valuable commodity for HUMAN NUTRITION as well. Changing consumer behavior causes a significant demand for vegetable protein products and opens more opportunities on sales market for OSR as ever before. This lets me strongly believe that OSR will have indeed a flowering future in the feed and the food area and beyond.
Major prerequisites for such a wishful development include:

- Better exploitation of yield potential in terms of farm yield via better adaptation of cultivars to abiotic stress and pathogens (i.e. complementation of chemical and biological approaches).
- Development of resilient agro-ecosystems by increasing crop diversity and improving crop rotations (i.e. diversification of cereal-centered agrosystems).
- Increase the added value of oilseed rape/canola via better exploiting the existing and potential diversity of valuable ingredients inside the rape seeds; e.g. improve and use rape-seed protein as a valuable alternative to animal protein.

All these scientific approaches and research activities will only be feasible and finally successful based on a strong and vital scientific community. As a well-established organization already established decades ago, GCIRC can better serve as this necessary basis. During the IRC 2019, the General Assembly of GCIRC has adapted and modified its constitution, based on corresponding suggestions and recommendation of the GCIRC Board. Major changes include:

I. The change of name: the acronym GCIRC from now on stands for "Global Council for Innovation in Rapeseed and Canola".

II. The reduction of membership fee: from now on the personal fee will be 75 EUR (until now 120 EUR).

With these changes we do hope to broaden the awareness of GCIRC in the whole "rapeseed/canola world" and strengthen its scientific potential, significance and relevance in the future!

I will not close my conclusion without thanking all participants for your attention and all the people involved in the congress planning for their great input and tireless commitment: Thank you very much for your kind attendance and valuable contributions.

With that I wish you a further eventful stay in Berlin and Germany, exciting field trips and finally: a good and safe way back home.>>

Guided Post-Congress-Tours

As a special « present » to the IRC visitors from abroad, Field Tours to different regions in Germany relevant for rapeseed research and cultivation were organized: the North, the South and the West Tour. Whereas the first tour headed to locations in Brandenburg and Mecklenburg-West Pomerania, the second aimed for the visit of relevant sites in southern

Saxony-Anhalt and Saxony. Finally, the west tour lead to the medieval town of Quedlinburg in western Saxony-Anhalt where the large national research institution Julius Kuehn-Institute (JKI) is based. Here, participants could learn more about the applied research program on cultivated plants including rapeseed. On day 3, the Experimental Farm Rauischholzhausen of the University of Giessen in Hesse was visited; this tour provided an overview on field experiments on many crop species incl. rapeseed and official VCU-trials.

In this short report, we are focusing on the latter West Tour as an example.

The bus arrived in Quedlinburg (QLB) in the evening of June 19th, so that we had time for a guided city tour of the medieval city on the same evening. Then, we have got started with the visit of the JKI centre on the next morning, June 20th. After the welcome and introduction by the Vice president of JKI, Prof. Peter Zwerger, and several senior scientists (Dr. Brandes, Mr Hausmann, Dr. Serfling, Dr. Will) gave us introductions into the whole institution and their specific research projects in terms of field trials, greenhouse experiments focusing on resistance research and pre-breeding activities: altogether a very informative and highly qualified tour of the JKI research centre at Quedlinburg.

During early afternoon we continued our bus tour to Marburg/Lahn (MR): again, a guided tour of the picturesque city in the evening. In the morning of June 21st, the bus brought us to the University of Giessen, Experimental farm of Rauischholzhausen, where Prof. Rod Snowdon, Head of the Plant Breeding Department, and several scientists incl. Dr. Obermeier, Dr. Stahl, Dr. Wittkop a.o. were waiting for the visitors. A very informative tour and introduction into various research projects on agronomical issues and breeding projects run at this farm using field and greenhouse studies included detailed demonstrations of the innovative work carried out at this active and prospering institute.

Foreign guests afterwards continued their journey via Giessen or Frankfurt railway stations and/or Frankfurt International Airport (accompanied and very well assisted by Florian Boenigk, WPR).

Participants have expressed their appreciation for the intense scientific and sightseeing program and the amount of information provided during this tour: it has been a great success!

16th IRC in Sydney, Australia

The GCIRC Executive board and General Assembly approved the proposition of Australia to organize the next 16th International Rapeseed Congress, in 2023, in Sydney, which will take place 24 years after the memorable Australian edition in Canberra, in 1999.

At the end of the Berlin Congress and following the tradition, Robert Wilson presented the next congress and hosting city.

"Dear Friends and Colleagues, it is a great pleasure to be able to invite you to you to be a part of the International Rapeseed Congress to be held in Sydney, Australia.

The Congress will run from 24-27 September at the International Convention Centre (ICC) Sydney in one of the world's most picturesque cities. Surrounded by a majestic Harbour and scattered with beaches, national parks and green areas, Sydney is a city that will entice you to explore. ICC Sydney is at the heart of its very own. Sydney harbour waterfront precinct, set amongst restaurants, retail and a vibrant public domain on Darling Harbour yet only a moment's walk to Australia's largest CBD, Barangaroo, local universities, Sydney Harbour Bridge and The Sydney Opera House.

Sydney – it's closer than you think!"

Welcome to New GCIRC members

Following the International Rapeseed Congress in Berlin, we have the pleasure to welcome 12 new GCIRC members: from Australia (1), Canada (1), China (2), France (1), India (5), Poland (1) and USA (1).

- ARORA Rakesh Kumar, from India, Tierra Agrotech Private Limited
- CHOUDHARY B.R., from India, Agriculture University, with main interest in Plant Breeding & Genetics

- DESPEGHEL Jean-Pierre, from France, Despeghel consulting SAS, with main interests in Breeding, genetics, agronomy, pathology, process and uses, economy, challenges…
- GUPTA Mahesh Chand, from India, RASI SEEDS INDIA, with main interest in Breeding, genetics, biotechnology, pathology, biochemistry, process, physiology.
- JIANG Lixi, from China, Zhejiang University, with main interest in Plant Breeding & Genetics
- KAPUR Arvind form India, ACSEN HYVEG, with main interest in Plant Breeding & Genetics
- LU Kun from China, Southwest University, with main interest in Genetics and Genomics
- MIKULSKI Tomasz, from Poland, Norddeutsche Pflanzenzucht Hans-Georg Lembke KG
- NASH Michael, from Australia, University of Adelaide, with main interest in Sustainable pest management
- OLIVIER Chrystel, from Canada, Agriculture and Agri-Food Canada, with main interest in Entomology and plant pathology
- SODHI Yaspal Singh, from India, ACSEN HYVEG, with main interest in Plant Breeding & Genetics
- STAMM Michael, from USA, Kansas State University

For most of them, you will find on the GCIRC website their personal webpage.

Collecting the 15th IRC presentations, let us go on!

There were 227 presentations delivered at the 15th IRC program (keynotes, plenary, oral), plus 48 presentations during the workshops, and 337 posters.

So far, the GCIRC Secretariat already received 56 presentations and 71 posters, which is an interesting result.

These presentations and posters will be put online on the new GCIRC website: expected to launch in new year of 2020.

If you face constraints regarding the publication of your original results in peer review journals, please inform us of the publication when accepted.

If not, we encourage you to send us your presentations to contribute to the memory of the news findings in rapeseed/canola research.

Scientific news

Publications:

BREEDING

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Liu, R., Ding, LN., Li, M. et al. Characterization of a Rapeseed Anthocyanin-More Mutant with Enhanced Resistance to **Sclerotinia sclerotiorum**. J Plant Growth Regul (2019). https://doi.org/10.1007/s00344-019-10011-4

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Value chains and regional news

- **USA**

Reported by US Canola Association Newsletter "Canola Quick Bites" Aug 2019 https://www.uscanola.com/newsletter/canola-quick-bytes-august-2019/

"Cargill received approval from the U.S. Department of Agriculture to grow biotech omega-3 canola. The company says this crop will address a gap in supply for fish oil and reduce stress on aquaculture. Cargill has been testing this crop in Montana since 2015."

Read more on: https://www.feednavigator.com/Article/2019/08/09/Cargill-gets-green-light-for-omega-3-producing-canola

- **Canola proteins Canada**

Reported by US Canola Association Newsletter "Canola Quick Bites" Aug 2019 https://www.uscanola.com/newsletter/canola-quick-bytes-august-2019/

« Canadian Burcon NutraScience Corporation announced it entered into a joint venture with an investor group to build a new CDN $65 million pea- and canola-protein commercial production facility in Western Canada. The plant will be the world's first commercial, food-grade **canola protein production** facility, producing Supertein®, Puratein® and Nutratein® canola proteins. The facility is expected to open in 2020. »

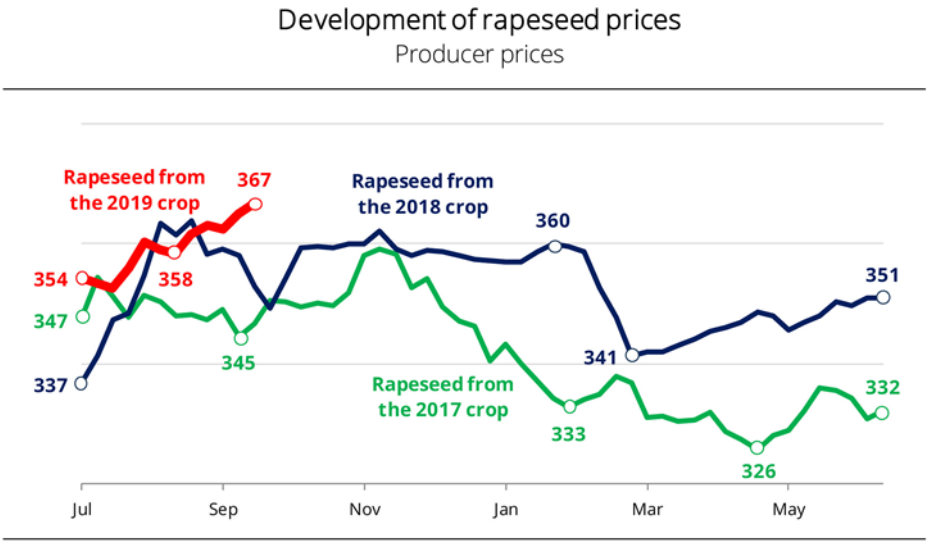
And later Burcon communique on Sept 17 : https://www.burcon.ca/2019/09/burcon-updates-on-development-activities-2/

- **Rapeseed prices: Europe and Canada**

UFOP reports that Rapeseed prices clearly exceed year-ago level. (https://www.ufop.de/english/news/chart-week/ see chart of the week 39)

"The small EU rapeseed crop and firm forward prices drove up producer prices for rapeseed considerably. Also, feedstock demand from oil mills picked up over the past weeks.

At the beginning of the 2019/20 marketing year, farm rapeseed prices climbed sharply. The rise was due to the small rapeseed harvest in Germany and the EU in 2019. At the beginning of July, prices were at EUR 354 per tonne. At the end of August, they already surpassed the mark of EUR 360 per tonne and most recently, they hit EUR 367 per tonne. In other words, rapeseed prices were up EUR 14 per tonne from the previous year and even EUR 20 per tonne from 2017."



This information may be completed by another one reported by the US Canola Association: "Growers in Canada are allocating more land for barley, corn, dry peas, lentils and oats and fewer acres for canola, wheat, and soybeans in 2019, according to Statistics Canada." See: https://www.ctvnews.ca/canada/canadian-farmers-expect-to-plant-fewer-canola-seeds-amid-ongoing-china-row-1.4483390 . According to the Field Crops survey of Statistics Canada published in June, based on information on field crop seeded areas in Quebec, Ontario, Manitoba, Saskatchewan, and Alberta from May 14 to June 11, farmers reported planting 21 million acres of canola in 2019, which is down 8 per cent from 2018. The decrease was attributed to lower prices for canola this year thanks, in part, to China's ban on canola imports from Canada and high global supply of oilseeds, Statistics Canada said.

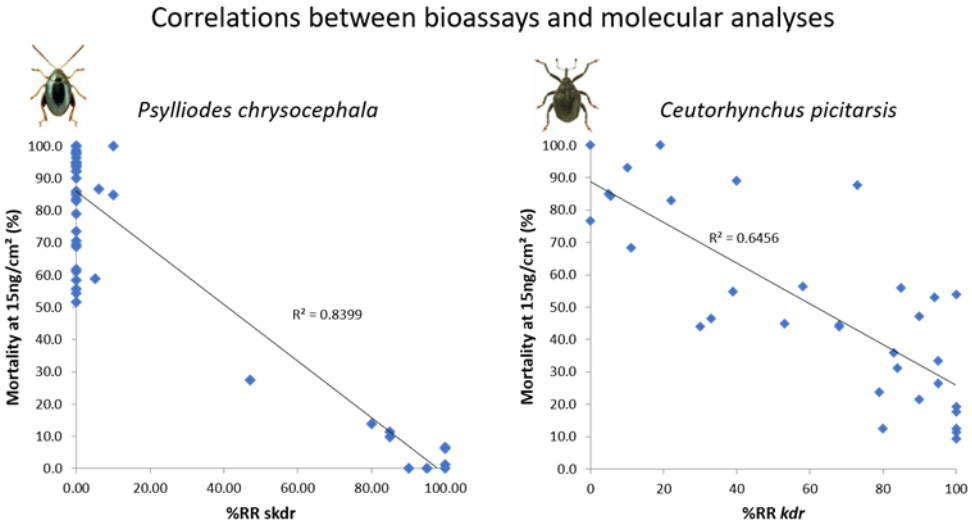
- **France: a new methodology to monitor resistances to insecticides**

Terres Inovia Crop Protection and Genetics Laboratory informs about a new methodology facilitating the monitoring of resistances to insecticides, after a presentation made during the 15th IRC in Berlin.

Terres Inovia presented an overview of the situation of resistances to pyrethroids insecticides in France. Data produced since 2013 show populations of cabbage stem flea beetle (Psylliodes chrysocephala) and rape winter stem weevils (Ceutorhynchus picitarsis) with significant decreases in sensitivity extend on French territory.

Results obtained in laboratory reveal a good correlation between pyrethroid sensitivity of these 2 insects' species and mutations in sodium channel gene M918L (skdr) for cabbage

stem flea beetle, and L1014F (kdr) for rape winter stem weevil. These genotyping were carried out thanks to a method developed in the crop protection and genetics laboratory of Terres Inovia. This is based on a SANGER sequencing technique and can also detect mutations responsible for resistances referenced in other insects (L925I and T929N).



This is a significant advance as this approach has improved resistance monitoring by increasing sampling. Indeed, characterization of sensitivity by genotyping requires only about 20 individuals (adults or larvae) whereas phenotyping analysis requires a minimum sampling of 250 fully active individuals, which represents often a restraint on analysis.

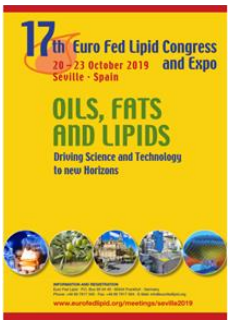
Resistance levels and understanding of the mechanisms involved are a necessity to effectively advise farmers. They make it possible to avoid unnecessary treatments in areas where efficacy of pyrethroids is poor, and to maintain acceptable levels of resistance through a suitable alternation of insecticides strategy in populations where mutations are not fixed.

Terres Inovia is pursuing these analyzes and has extended the method to other species of beetle insects. For more information, visit Terres Inovia's website.

Contact: Julien Carpezat: j.carpezat(at)terresinovia.fr

Upcoming International and national events

20-23 October 2019, 17th Euro Fed Lipid Congress and Expo. Seville, Spain http://www.eurofedlipid.org/index.html



Nov. 7, 2019. 13th Annual Canola Research Conference. Fargo, N.D. USA, North Dakota State University. Canola researchers from the region will present their 2019 findings.

Nov 13–14, 2019. The Canola Discovery Forum. Winnipeg, MB, Canada. This forum, hosted by the Canola Council of Canada, focusses on Integrated Pest Management innovations and strategies to sustainably improve canola production.
http://canoladiscoveryforum.ca

December 04-05, 2019: Canola Week 2019; Saskatoon, Canada.
https://event-wizard.com/canola2019/0/pages/118519/

19-20 January 2020, 2nd Congrès Lipids & Cosmetics, Bordeaux France
https://lipidscosmetics.sciencesconf.org

3-5 February 2020. iCROPM2020. Crop modelling for Agriculture and Food Security under Global Change. Montpellier, France. https://www.icropm2020.org/

9-12 February 2020. World congress on oils and fats 2020. Sydney, Australia.
www.wcofsydney2020.com

September 24-27, 2023 16th International Rapeseed Congress, Sydney, Australia
www.irc2023sydney.com

We invite you to share information with the rapeseed/canola community: let us know the scientific projects, events organized in your country, crop performances or any information of interest in rapeseed/canola R&D.

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