



FAO/IAEA International Symposium on Plant Mutation Breeding and Biotechnology

**IAEA Headquarters
Vienna, Austria**

27–31 August 2018

Ref. No.: IAEA-CN-263

Announcement and Call for Papers

A. Background

The year 2018 marks the 90th anniversary of mutation induction in plants. This international symposium aims to review the successes that have been achieved in the field of plant mutation breeding and to present innovations in mutation induction, including genome editing, as well as the latest advances in combining field-based selection with genomics-based plant breeding technologies. Over the last fifty years, the Food and Agriculture Organization of the United Nations (FAO) and the International Atomic Energy Agency (IAEA) have played a critical role in supporting their Member States in the use of induced mutations to develop improved crop varieties. The successful application of gamma rays and other physical and chemical mutagens in plant breeding over the past 90 years has increased crop biodiversity and productivity across the world. The number of officially released crop mutant varieties is more than 3200, which clearly demonstrates the successful role that nuclear technology can play in enhancing food security, especially in developing countries. This has resulted in the widespread use of induced mutants in plant breeding programmes throughout the world and has brought about enormous economic benefits and improved living standards. By capitalizing on these advances, plant mutation breeding will continue to make a substantial contribution to productive and more diversified agricultural systems that are better adapted to climate change.

In August 2008, FAO and the IAEA sponsored the International Symposium on Induced Mutations in Plants, which brought together around 500 participants from 82 Member States and nine international

organizations/institutions. Since then, there have been many further technical innovations and new success stories have emerged. Significant progress has been made in technological development, biological research and in the application of induced mutations to develop improved crop varieties and to discover genes that control important traits. During the last ten years, mutation breeding has made a significant contribution to food security in Member States. Over 230 mutant varieties belonging to 44 different species were released in 26 Member States. Thousands of mutant lines currently contribute to conventional breeding programmes in Member States and, in general, to the enhancement of biodiversity across the world. All these achievements have played their part in promoting global food security and poverty alleviation.

In the light of Member States' increasing concerns over the negative effects of climate change on food security, a mutation breeding approach can continue to help enhance the adaptability of crops and promote diversification of crop production and broadening of crop diversity in support of climate smart agriculture. Commercial crops have a narrow genetic base, which makes them vulnerable to environmental threats. Induced mutation offers many benefits with regard to crop improvement, especially when there is no reliable source of traits (variation) in nature that could be introduced to varieties by conventional breeding techniques such as hybridization. The induced mutation technique is becoming increasingly important to bring about heritable changes in plants and offer new genetic variation to plant breeders.

Plant biotechnologies are crucial to the effective application of mutation breeding techniques, and they are increasingly being considered for crop improvement to ensure that crops are better adapted to climate change. The application of mutation induction coupled with biotechnologies, such as doubled haploid and molecular marker techniques, can speed up all the main stages of breeding programmes, from the generation of variability, through selection to rapid multiplication of the desired genotypes.

Therefore it is appropriate and timely to convene an international symposium with a broad coverage which will serve as a forum for addressing topics of current scientific interest and exchanging research experience and developments. The symposium will discuss priorities for future work and, in particular, the contribution that plant mutation breeding can make to food security in the light of climate change. This symposium will not only address technical aspects of plant mutation breeding but will also cover socio-economic impact and environmental issues related to crop mutant varieties.

B. Objectives

The purpose of the symposium is to review achievements, new developments, trends and challenges in the field of plant mutation breeding, and to foster a broad exchange of information within the scientific community, as well as between the scientific community and the private sector. The symposium will highlight specific challenges faced by Member States, such as emerging transboundary threats to crop production, and will also assess the overall importance of mutation breeding to food security.

The symposium and its deliberations and conclusions will provide useful feedback to the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture which will help it to address Member States' needs in future programming.

C. Format and Topics

The structure of the symposium will be based on selected plenary lectures, thematic sessions with keynote addresses, contributions by participants in the form of oral presentations and posters, as well as panel discussions. A limited amount of space will be available for commercial vendors' displays/exhibits during the symposium.

A series of plenary sessions will address the topics listed below, and the symposium programme will include invited keynote speakers from academia, oral presentations and panel discussions. There will be sufficient time for viewing of posters, and for discussion and interaction among the participants. A final round-table session will discuss the main conclusions drawn in the plenary sessions and will summarize recommendations for future development.

The scope of the symposium is meant to cover, but is not limited to, the following topical areas:

- Contribution and impact of mutant varieties on food security
- Mutation breeding for adaptation to climate change in seed propagated crops
- Mutation breeding for ornamental and vegetatively propagated crops
- Enhancing agricultural biodiversity through new mutation induction techniques
- New challenges and technologies in plant genomics and breeding

D. Target Audience

It is expected that this symposium will attract eminent basic research scientists and geneticists and plant breeders from all over the world. Therefore, the symposium will at once provide opportunities to present and discuss current research and technology development in this field and establish linkages among scientists in order to develop knowledge-based breeding strategies. It will also enable project managers from international and national organizations, as well as multinational and private companies engaged in plant breeding activities, to bring themselves up to date on developments in the application of novel technologies in mutation techniques. Accordingly, the target audience for this symposium will include:

- Plant breeders involved in mutation breeding;
- Geneticists engaged in applied research related to crop improvement;
- Molecular geneticists and scientists engaged in basic research;
- Plant pathologists; and
- Stakeholders involved in crop production.

E. Expected Outcomes

The symposium will enhance awareness among senior managers in FAO and IAEA Member States of the impact of plant mutation breeding and related techniques on food security and of future needs in this area.

The symposium will identify the latest developments and future trends in the topics covered as well as assess the overall importance of induced mutations in crop research and development. The conclusion session will provide recommendations, guidance for plant breeders, plant biologists, biotechnologists and functional genomics researchers, as well as project managers on the planning and implementation of plant breeding programmes involving the use of induced mutations.

The symposium will result in extensive exchange of information and networking among participants on the new technologies involving induced mutations in plants, as well as thorough discussions of the trends and driving forces in the field of plant mutation breeding and genetics for crop improvement. This includes developments in the rapidly evolving fields of mutation screening using phenotypic and genotypic screening/selection methods, new approaches based on genome editing, as well as the latest developments in molecular marker applications.

It is intended that the papers presented at the symposium will form the basis of a book to be published by an external publisher and that all participants will receive a free copy of this book. Participants with contributions selected for publication in the book will receive instructions for the preparation and submission of their papers.

F. Abstracts, Presentations and Proceedings

All participants who wish to give presentations (orally or in the form of posters) at the symposium must submit an abstract on one of the topics listed under Section C. The abstract should give enough information on the contents of the proposed paper to enable the Programme Committee to evaluate it. Introductory and general matters should not be included. Due to the time limit for oral presentations, only a selected number of abstracts will be accepted for oral presentations.

F.1. Submission of Abstracts

Abstracts must be submitted through the symposium's web browser-based file submission system (IAEA-INDICO) which will be accessible through the symposium web page (Section P) from **20 October 2017 to 28 February 2018**. No other submission route will be accepted.

The submission should indicate to which of the topics outlined in Section C above it relates and the abstract content should be sequenced accordingly:

- Background
- Methodology
- Results
- Conclusion

The abstract:

- should have a maximum of 300 words;
- should not include more than one figure, graph or table;
- should not include references; and
- must be submitted through INDICO.

In addition, authors must submit the following two forms to their competent national authority or to an organization invited to attend (see Section G) for transmission to the IAEA:

- Participation Form (Form A); and
- Form for Submission of a Paper (Form B).

These forms must be received by the IAEA no later than **28 February 2018**.

IMPORTANT: The electronically received abstracts will be considered by the Programme Committee only if these two forms have been received by the IAEA in accordance with registration procedure (see Section G).

F.2. Acceptance of Abstracts for Oral or Poster Presentation

The Secretariat reserves the right to exclude abstracts that do not comply with its technical or scientific quality standards and/or that do not apply to one of the topics in Section C above.

Authors will be informed by **30 April 2018** as to whether their abstracts have been accepted for oral or poster presentation. The abstracts, if accepted by the Programme Committee, will also be reproduced unedited in the electronic *Compilation of Abstracts*, which will be made available to all participants at the beginning of the symposium.

F.3. Proceedings

It is intended that some of the oral or poster presentations at the symposium will form the basis of a new book to be published by an external publisher and that all participants will receive a free copy of this book. Participants with contributions selected for publication in the book will receive timely instructions for the preparation and submission of their papers.

G. Participation and Registration

All persons wishing to participate in the symposium have to be designated by an FAO or IAEA Member State or should be members of organizations that have been invited to attend. The list of invited organizations can be requested from the Symposium Secretariat (see Section O).

In order to be designated by an FAO or IAEA Member State, participants are requested to send the following forms (as applicable) to their competent national authority (e.g. Ministry of Foreign Affairs, Ministry of Agriculture, Ministry of Science and Technology, Permanent Mission to the IAEA or National Atomic Energy Authority):

- Participation Form (Form A): participation only; no deadline if only Form A is submitted;

- Form for Submission of a Paper (Form B): participants submitting a paper contribution through INDICO, have to send the completed and signed Form B together with Form A to their competent national authority for onward transmission to the IAEA (Official.Mail@iaea.org) by the given deadline;
- Grant Application Form (Form C): participants requesting financial support from the IAEA, have to complete Form C and send it together with Form A (and Form B, if applicable) to the competent national authority for onward transmission to the IAEA (Official.Mail@iaea.org) by the given deadline. Form C has to be stamped and signed by the competent national authority.

Participants who are members of an organization invited to attend, are requested to send the above form(s) through their organization to the IAEA (Official.Mail@iaea.org).

In addition, participants are requested to pre-register online through the symposium website <http://www-pub.iaea.org/iaeameetings/56061/FAO-IAEA-International-Symposium-on-Plant-Mutation-Breeding-and-Biotechnology>.

Participants who registered in accordance with the above procedure will receive from the IAEA further information approximately three months before the opening of the symposium.

Please note that in 2018 it will become possible to manage the entire registration process electronically, when the new InTouch+ (<https://intouchplus.iaea.org>) facility — the improved and expanded successor to the InTouch platform currently used for the IAEA's technical cooperation events — will be made available for all regular programme meetings. Using InTouch+, prospective participants will be able to apply for meetings and submit all required documents online. National authorities will be able to use InTouch+ to review and approve these applications. Interested parties that would like to use this new facility should write to: InTouchPlus.Contact-Point@iaea.org.

H. Expenditures and Grants

No registration fee will be charged to participants.

The IAEA is generally not in a position to bear the travel and other costs of participants in the symposium. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Such assistance may be offered upon specific request to normally one participant per country provided that, in the IAEA's view, the participant on whose behalf assistance is requested will make an important contribution to the symposium.

If Governments wish to apply for a grant on behalf of one of their specialists, following documents have to reach the IAEA (Official.Mail@iaea.org) by the given deadline:

- Participation Form (Form A);
- Grant Application Form (Form C): stamped and signed by the Government;
- Deadline: **28 February 2018**

Applications that do not comply with the above conditions cannot be considered.

Approved grants will be issued in the form of a lump sum payment that usually **covers only part of the cost of attendance**.

I. Distribution of Documents

A preliminary programme will be posted on the IAEA symposium web page (see Section P) as soon as possible. The final programme and the electronic *Compilation of Abstracts* will be available free of charge upon registration at the symposium.

J. Exhibitions

A limited amount of space will be available for commercial vendors' displays/exhibits during the symposium. Interested parties should contact the Scientific Secretariat by email at ismbb2018@iaea.org by **31 January 2018**.

K. Working Language

The working language of the symposium will be English. All communications and papers must be sent to the IAEA in English.

L. Symposium Venue and Accommodation

The symposium will be held at the IAEA's Headquarters in Vienna, Austria. Participants must make their own travel and accommodation arrangements. Hotels offering a reduced rate for symposium participants will be listed on the symposium web page (see Section P). Please note that the IAEA is not in a position to assist participants with hotel bookings, nor can the IAEA assume responsibility for paying cancellation fees or for re-booking and no shows.

M. Visas

Designated participants who require a visa to enter Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria at least four weeks before they travel to Austria. Since Austria is a Schengen State, persons requiring a visa will have to apply for a Schengen visa. In States where Austria has no diplomatic mission, visas can be obtained from the consular authority of a Schengen Partner State representing Austria in the country in question.

N. Key Deadlines

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| Submission of abstract through INDICO (including submission of Forms A and B through a competent national authority – see Section G) | 28 February 2018 |
| Submission of grant application (Forms A and C through a competent national authority – see Section G) | 28 February 2018 |
| Notification of acceptance of abstract | 30 April 2018 |

O. Symposium Secretariat

General contact details of the Symposium Secretariat:

International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 VIENNA
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Administration and organization:

Ms Martina Khaelss

Conference Services Section

Division of Conference and Document Services

Department of Management

International Atomic Energy Agency

IAEA-CN-263

Tel.: +43 1 2600 21315

Email: M.Khaelss@iaea.org

Subsequent correspondence on scientific matters should be sent to the Scientific Secretariat of the symposium and correspondence on administrative matters to the IAEA Conference Services Section.

P. Symposium Web Page

Please visit the following web page regularly for new information regarding this symposium:

<https://www.iaea.org/events/plant-mutation-breeding-symposium-2018>.

Q. Greening

To demonstrate its commitment to sustainability, the IAEA will organize this symposium as a 'green meeting' according to the guidelines of the Austrian Ecolabel.

There will be a focus on the areas of paper smart documentation, waste reduction and recycling, and environmentally friendly catering.