IAEA International Atomic Energy Agency (/)

(/about/plant-breeding-and-genetics-section)

The central work area of this Section is to assist Member States in the design and implementation of innovative and effective plant breeding programmes using radiation-induced mutation through, for instance, gamma rays and X-rays, mutation detection and pre-breeding technologies, to enhance food security and sustainable crop production systems worldwide.

From mutation induction to mutation breeding

Through its laboratories in Seibersdorf, Austria, the Section develops protocols and guidelines to enhance the efficiency of crop mutation breeding. It provides training in all areas of plant mutation breeding, including the use of efficiency-enhancing technologies such as in vitro plant tissue culture and genomics technologies. It also provides services for mutation induction to

FAO and IAEA Member States. This includes the use of a gamma rays and X-rays to irradiate seeds or plant tissues to generate novel genetic diversity that can then be utilized to breed new, improved crop varieties.

Detection of novel induced mutations has long been a bottleneck in plant mutation breeding. The Section assists Member States in acquiring and establishing appropriate capacities to increase the efficiency of screening for desired traits in plants, and to accelerate the development of mutant lines into commercial varieties for farmers. It also provides technical advice and training courses to National Agricultural Research Systems in Member States on mutation breeding techniques.

Induced mutations occur at a much higher frequency than spontaneous mutations and therefore increase the chance of generating new desired traits in plants. The Section develops the capacities of Member States to incorporate useful mutants into their breeding programmes, in particular those in which farmers participate directly.

Promoting plant biodiversity and genetic resources

An integral part of the Section's activities is to promote diversified crop production and broad crop diversity for sustainable agriculture. Its central aim is to support methods that create novel biodiversity that Member States can use for crop improvement to increase their resilience to climate change. A supportive tool is the Joint FAO/IAEA Mutant Varieties Database (http://mvd.iaea.org) that comprises information on more than 3,200 officially released mutant varieties from over 200 plant species worldwide.

Publications

17 November 2011

Physical Mapping Technologies for the Identification and Characterization of Mutated Genes Contributing to Crop Quality (/publications/8651/physical-mapping-technologies-for-the-identification-and-characterization-of-mutated-genes-contributing-to-crop-quality)

More publications → (/publications/search/topics/plant-breeding-and-genetics-section)

Joint FAO/IAEA Centre

(https://www.iaea.org/about/organizational-structure/department-of-nuclear-sciences-and-applications/joint-fao/iaea-division-of-nuclear-techniques-in-food-and-agriculture)

Highlights

(http://www-naweb.iaea.org/nafa/pbg/index.html)

News

(/newscenter/news/cotton-in-pakistan-how-nuclear-techniques-are-helping-the-textile-industry)

Cotton in Pakistan: How Nuclear Techniques are Helping the Textile Industry (/newscenter/news/cotton-in-pakistan-how-nuclear-techniques-are-helping-the-textile-industry)

(/newscenter/news/improved-soil-and-nutrient-management-practices-increase-rice-yields-in-lao-pdr)

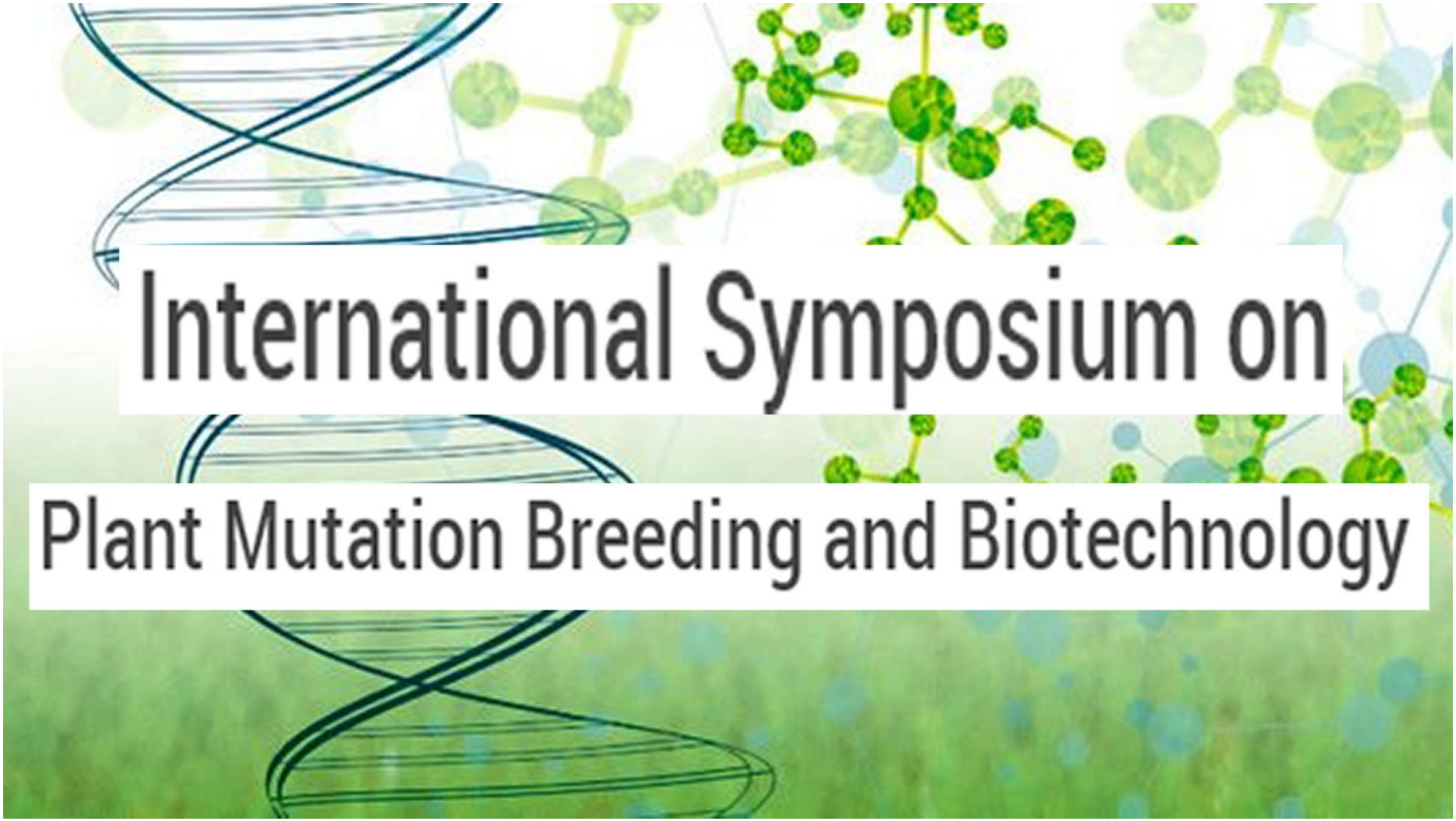
Improved Soil and Nutrient Management Practices Increase Rice Yields in Lao PDR (/newscenter/news/improved-soil-and-nutrient-management-practices-increase-rice-yields-in-lao-pdr)

More news → (/news/3340)

Projects

11 (/projects/technical-cooperation-projects/3340?type=3721&status=3723)

Active Technical Cooperation Projects



(https://www.iaea.org/events/plant-mutation-breeding-symposium-2018)

Related resources

- Plant Breeding and Genetics Laboratory (http://www-naweb.iaea.org/nafa/pbg/pbg-laboratory.html)
- Staff (http://www-naweb.iaea.org/nafa/pbg/staff-pbg.html)

Reports

- Social and Economic Impact Assessment of Mutation Breeding in Crops of the RCA Programme in Asia and the Pacific (https://www.iaea.org/sites/default/files/20/11/social-and-economic-impact-assessment-of-mutation-breeding-in-crops-of-the-rca-programme-in-asia-and-the-pacific.pdf)
- Social and Economic Impact Assessment of Mutation Breeding in Crops of the RCA Programme in Asia and the Pacific – a summary (https://www.iaea.org/sites/default/files/20/11/social-and-economic-impact-assessment-of-mutation-breeding-in-crops-of-the-rca-programme-in-asia-and-the-pacific-summary.pdf)
- Journeys to Success (https://www.iaea.org/sites/default/files/20/11/tc-journey-to-success-ap.pdf)

‹ Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture (/about/organizational-structure/department-of-nuclear-sciences-and-applications/joint-fao/iaea-centre-of-nuclear-techniques-in-food-and-agriculture)

Related pages

› Plant breeding (/topics/plant-breeding)

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