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NEW MUTATION TECHNIQUES APPLIED IN CROP IMPROVEMENT IN CHINA

There are at least 1 billion hungry people worldwide and the Asia and the Pacific region harbour the biggest estimated regional distribution of hunger. Lifting a billion people out of poverty and feeding an extra 2.3 billion by 2050 will require increasing cereal production by 70%, i.e. doubling the output of developing countries. Accelerating the development of agriculture to continually increase productivity should be the final approach to end the poverty. Mutation breeding techniques have played very significant roles in ensuring food security by developing new mutant germplasm and mutant varieties in China, which have generated tremendous social-economic impact. New mutagenesis approaches including space flight and heavy ion beam irradiation used as effective alternative new ways for crop genetic improvement was initiated in 1990s by Chinese scientists and great progresses have been made in the past 20 years. Protocols for crop mutation induction by space flight, energetic heavy ion beams have been established and applied for crop breeding. More than 950 mutant varieties with high-yielding, fine-quality and multi-resistant traits have been developed and officially released in main cereals, oil and vegetable crops, and have been playing important roles in agricultural production. A number of rare mutant germplasms that may have a breakthrough effect on main economic traits such as yield and quality were also identified and applied for breeding program. New development of space and heavy ion beam breeding will be heavily based on and associated with not only effective use of space research platforms, but also advanced plant omics and molecular biology.

Country or International Organization

China

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