

FAO/IAEA International Symposium on Plant Mutation Breeding and Biotechnology



Contribution ID: 209

Type: Oral

INDUCED MUTAGENESIS FOR BEAN (*PHASEOLUS VULGARIS* L.) PRODUCTION IMPROVEMENT IN BULGARIA

Although historically a surplus food producer, Bulgarian agriculture has faced a downturn in recent decades. Local legume cultivars have lost favour with farmers and the canning industry, due to their low productivity in comparison with the imported ones. Diseases and abiotic stresses are the most important factors limiting the production of edible legumes, costing farmers hundreds of euros in lost revenue each year. The overall objective of our ongoing bean mutation breeding programme was to enrich the gene pool of *P. vulgaris* L. and to develop genotypes resistant to *Xanthomonas campestris* pv. *phaseoli* (Smith) Dye and *Pseudomonas syringae* pv. *phaseolicola* (Gardan) using EMS. The two most common varieties (an heirloom and a snap bean type) in Bulgaria were selected as parents, and their sensitivity to the chemical mutagen EMS was explored. After determination of LD50, 1000 seeds were treated and reproduced in the field in M1 population. All M2 mutant plants were grown in field conditions, a number of phenotypic changes were observed on these mutated plants, which were also screened for disease resistance via leaf artificial inoculation. Individual plant selection was performed for the putatively resistant ones. In M3 generation these lines were screened using artificial inoculation with pathogens (leaves and pods) under field conditions. The expression patterns of genes putatively involved in the resistance reactions towards two races of casual *P. syringae* were determined using qRT-PCR for the specific and reference genes. Selected M3-M4 lines with confirmed disease resistance were tested for fresh pod quality. Yield tests were started in M4 and M5, according to their yield results. Mutants are being advanced to M6 or M7 generation for validation. In conclusion, plants with visible morphological changes and/or increased tolerance to the two targeted bacterial diseases were selected. Mutant lines for beans are in the pipeline, which will boast competitiveness in international markets.

Country or International Organization

Bulgaria

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Track Classification: Mutation breeding for adaptation to climate change in seed propagated crops