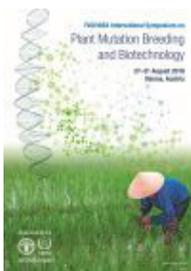


FAO/IAEA International Symposium on Plant Mutation Breeding and Biotechnology



Contribution ID: 190

Type: Poster

IRRADIATION OF THE POTATO SOLANUM TUBEROSUM CV. DESIRÉE TO INVESTIGATE RESISTANCE TO THE POTATO CYST NEMATODE GLOBODERA PALLIDA

Potato cyst nematodes (PCN) pose an increasing threat to the potato industry and continue to be spread into clean land. Management with chemical control is problematic due to restrictions on the use of nematicides. Creating potato cultivars with durable and broad-spectrum resistance to PCN is a priority for potato breeders, especially to *Globodera pallida* for which few cultivars with high levels of resistance are available. Here, we investigate the effects of gamma-irradiation of the tetraploid potato *S. tuberosum* cv. *Desirée* to generate desirable mutations, such as resistance to the potato cyst nematode *G. pallida* in an established cultivar. Tubers were sent to the FAO/IAEA Plant Breeding and Genetics Laboratory, Seibersdorf, Austria. The first step was to produce *in vitro* materials which were then micropropagated to develop a large population for the gamma irradiation. Irradiated cuttings (with different dose treatments) were then cultured to produce *in vitro* micro-tubers, which were returned to the JHI. The mutated micro-tuber population was planted into root-trainers filled with compost and 20 cysts of a representative UK *G. pallida* population, pathotype Pa2/3. After 7 weeks the number of female nematodes on the root surface were scored and the relative level of resistance determined. Root systems from 2,000 of 2,133 micro-tubers of *S. tuberosum* cv. *Desirée* were scored; the remainder did not grow or only very poorly and were thus, discarded. 75 plants were re-assessed twice with the same *G. pallida* population with 4 replicates each. As a result, 5 plants with consistently low numbers of *G. pallida* females compared to non-irradiated plants were identified. Tubers were produced from these plants, and further tests to determine their resistance to three *G. pallida* populations that differ in their virulence are in progress. This work developed a new *in vitro* (micro-tuber) system for potato mutagenesis. The phenotypic screening is still in progress, conclusions cannot yet be drawn whether stable resistance in a tetraploid potato cultivar to *G. pallida* has been achieved by induced mutation.

Country or International Organization

United Kingdom

Author: Ms GARTNER, Ulrike (The James Hutton Institute,)

Co-author: Dr BLOK, Vivian (The James Hutton Institute)

Presenter: Ms GARTNER, Ulrike (The James Hutton Institute,)

Track Classification: Contribution and impact of mutant varieties on food security