Steps in mutant variety development

1. Identification of the problem — Be familiar with the nature (seasonality, habit, resistance to environmental stress, etc.) and cultural requirements, uses of and demand for the plant.

2. Statement of objectives based on the problems identified regarding the plant

3. Planning and employment of proper methodologies — Consider the planting materials and mutagens to be used (such as radiation and chemicals)

4. Radiosensitivity study — Study the effects of varying doses of the mutagen on the planting material and determine the optimum dose to be used.

Irradiation of planting material at the Gammacell-220 facility

5. Evaluation and selection — Evaluate the changes that occur in the planting material treated with mutagen. For purification, select the plants with desirable characteristics which have met the objectives of the mutation breeding program

6. Purification and verification — Ensure the stability of the selected mutants by propagating them for several planting generations. At this stage, the uniqueness or distinct qualities of the selected plants from the original plant may be determined using molecular techniques.

7. Mass propagation — Multiply the selected mutant plants in sufficient quantities to ensure that there is reliable stock for field trials, market trial and registration purposes.

8. Plant registration — Register a mutant plant if it is new, distinctly different from existing or known varieties, and if its characteristics are uniform and stable.

9. Release and commercialization

For more information on Improvement of Ornamentals Through Gamma Irradiation, please write or call:

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INDUSTRY

Improvement of Ornamentals Through Gamma Irradiation

Improvement of Ornamentals Through Gamma Irradiation

Plant breeders use various techniques to improve certain desirable qualities in plants. The PNRI uses the mutation breeding technique to develop new and improved varieties of plants.

Murraya 'Ibarra Santos'

Mutation breeding

Mutation breeding is a non conventional method of plant breeding to improve crops by using mutational agents (mutagens) such as radiation or chemicals, e.g., ethyl methyl sulfonate. Radiation can induce hereditary changes, or mutations, in the parent crop from which mutants with desirable attributes will be selected and will be developed as new varieties.

Dracaena 'Marea'

Impact of the Mutant Varieties of Ornamental Plants

The new mutant varieties of ornamental plants provide new products for commercial growers to propagate, introduce into the market and commercialize. Small and medium scale plant nursery owners may consider producing and marketing the new mutant varieties for added income and employment.

The technology for the development of mutant ornamental plants may be applied to other agricultural crops.

Freycinetia 'Golden Stairs'

Cordyline 'Medina'

Cordyline 'Afable'

Sansevieria 'Sword of Ibe'

New and Improved Mutant Varieties Developed by PNRI

PARENT MATERIAL / VARIETY	MUTANT VARIETY	MUTATED CHARACTER / MAIN ATTRIBUTES OF THE VARIETY	STATUS OF MUTANT
Murraya paniculata (Kamuning)	*Murraya* 'Ibarra Santos'	Semi-dwarf or slow growing & floriferous mutant	Approved by the National Seed Industry Council (NSIC), Department of Agriculture in 2001 Being commercialized
Dracaena sanderana (Corn plant)	*Dracaena* 'Marea'	Chlorophyll mutant	Approved by NSIC in 2001 Being commercialized
Cordyline fruticosa 'Itchy Red'	*Cordyline* 'Medina'	Chlorophyll mutant	Approved by NSIC in 2005 Being commercialized
Freycinetia multiflora	*Freycinetia* 'Golden Stairs'	Female, chlorophyll mutant	Approved by NSIC in 2008 For commercialization
Sansevieria 'Moonshine'	*Sansevieria* 'Sword of Ibe'	Chlorophyll mutant	Approved by NSIC in 2008 For commercialization
Cordyline fruticosa 'Kiwi'	*Cordyline* 'Afable'	Chlorophyll mutant	Approved by NSIC in 2009 For commercialization