

# FAO/IAEA International Symposium on Plant Mutation Breeding and Biotechnology



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## RECURRENT MUTAGENESIS FOR WINTER WHEAT GENETIC IMPROVEMENT

Evaluation of winter wheat mutant lines (2010-2017, up to M8 generation) has been carried out. Dried seeds of eight varieties Favoritka, Lasunya, Hurtočina (irradiation of initial material by gamma rays), line 418, Kolos Mironovschiny (field hybridization), Sonechko (chemical mutagenesis, nitrosodimethylurea 0.005%) and Kalinova (chemical mutagenesis, 1,4-bisdiazotsetilbutan DAB 0.1%), Voloshkova (termomutagenesis –low plus temperature at plant development stage of vernalization has been used as mutagen factor) of winter wheat (*Triticum aestivum* L.) were subjected to 100, 150, 200, 250 Gy gamma irradiation and treated with solutions of chemical mutagens - nitrosomethylurea 0.0125 and 0.025 %, nitrosoethylurea –0.01 and 0.025 %, 1,4-bisdiazotsetilbutan –0.1 and 0.2 %, dimethylsulfate –0.0125, 0.025 and 0.05 %.

The chemical mutagenesis is effective for radio-mutants, gamma rays –for chemomutants, for the breeds created using the method of field hybridization it makes no difference. It is more efficient to use better by grain productivity and protein quantity varieties as initial material for mutagenesis.

Gamma-rays dose 100 Gy as a mutagen factor was the most successful in induction productive mutations. Medium dose of gamma-rays (100 Gy) and concentrations of nitrosoalkylureas (0.01 –0.0125 %) are recommended for winter wheat mutation breeding on grain productivity.

In terms of research program we obtained six high-productive lines. For these lines higher value of two components of yield structure (1000 grain weight and grain weight per plant) was typical during field estimation. Other indexes didn't get significant influences on yield performance. Three from them have higher protein content than standard. Five lines were identified as drought-resistant (with the lower ratio between photosystem II and photosystem I). Four winter wheat lines (Giant, Leroy, Dead, Lean) were recommended for state varieties exam.

### Country or International Organization

Ukraine

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