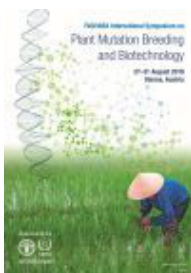


# FAO/IAEA International Symposium on Plant Mutation Breeding and Biotechnology



Contribution ID: 169

Type: Oral

## DEVELOPMENT OF SOYBEAN MUTANT GENOTYPES WITH REDUCED ANTI-NUTRITIONAL FACTORS

Soybean (*Glycine max* L. Merr.) is an important legume crop of India. Because of its high protein content, soybean is also used as nutritionally important feed in animal and poultry industry. However, consumption of soybean seed as food is restricted because of the presence of many anti-nutritional factors like trypsin inhibitors and phytic acid. Trypsin inhibitors are considered anti-nutritional factor because high levels of trypsin inhibitors cause poor digestion of dietary proteins by inhibiting the trypsin enzymes. Phytic acid is considered as an anti-nutritional factor as it can chelate with important mineral micronutrients, rendering them virtually unavailable to humans and non-ruminant livestock. Mutation breeding has been used to isolate soybean mutants with low trypsin inhibitor and phytic acid. In this study, soybean cultivars JS 93-05 and NRC-37 were irradiated with 250 Gy gamma rays to induce genetic variability. Mutants showing altered morphological characters were identified. We screened 300 true breeding (M7 generation) soybean mutants for identifying genotypes with low trypsin inhibitor and phytic acid content. Trypsin inhibitor concentration was estimated using BAPNA as substrate and phytic acid content was estimated using colour variation with Wade reagent. Trypsin inhibitor content in the mutants varied from 23 to 48 TIU/mg. One mutant TSG(M)-66 was found with up to 50% lower trypsin inhibitor concentration (23 TIU/mg) compared to parent JS93-05 (46 TIU/mg). The phytic acid content in the mutants varied from 12 to 18 mg/g. Two mutant lines NRC37-14 and TSG(M)-49 were identified with up to 40% lower phytic acid content (12 mg/g) compared to the parents (20 mg/g). The mutant lines identified will serve as important breeding material for developing low trypsin inhibitor and low phytic acid soybean cultivars.

### Country or International Organization

Department of Atomic Energy, India

**Author:** Dr GUPTA, Sudhir kumar (Nuclear Agriculture and Biotechnology Division, Bhabha Atomic Research Centre, Trombay, Mumbai-400 085, India)

**Co-author:** Dr MANJAYA, Joy (Nuclear Agriculture and Biotechnology Division, Bhabha Atomic Research Centre, Trombay, Mumbai-400 085, India)

**Presenter:** Dr GUPTA, Sudhir kumar (Nuclear Agriculture and Biotechnology Division, Bhabha Atomic Research Centre, Trombay, Mumbai-400 085, India)

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