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Development of Kunitz trypsin inhibitor free soybean using marker assisted backcross breeding

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Soybean [*Glycine max* (L.) Merrill] has become the leading oil seed crop in India and is cultivated in an area of around 10.7 million hectares with a production of 12 million tons. It contributes about 43% of the oilseed crop and 25% of the edible oil production in the country. Soybean is the main crop also helpful in eradicating the protein malnutrition, due to its high protein content of the seed. Today soybean is also being used in food and as health supplement. The acceptance of soy foods has been restricted by the presence of protease inhibitors and off flavors to processed foods. Kunitz trypsin inhibitor (KTI) is one of the major protease inhibitor, which inhibit trypsin activity and has been shown to be responsible for growth inhibition, pancreatic hypertrophy and hyperplasia in experimental animals. Development of KTI-free soybean varieties will lead to popularizing of soybean as vegetable and other food products.

Studies were undertaken using marker assisted selection (MAS) for development of Kunitz trypsin inhibitor free soybean varieties. Two popular soybean varieties 'MACS 450' and 'JS 93-05', grown in the country was used for introgression of null alleles of kunitz trypsin inhibitor, using back cross breeding method. Recovery of the genotype of recurrent parent was done by back ground selection using molecular markers. PI 542044 an exotic germplasm line which was free from KTI but poor in yield was used as donor for the null character.

Development of Trypsin free soybean using molecular markers for identification in each generation and backcrossing along with improved yield in the variety MACS 450 and JS 93-05 is described in the paper.