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Argentina registers first gene-edited potato, targeting browning and processing waste

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Developed by INTA researchers, OLI INTA is designed to prevent enzymatic browning and impact-related bruising, potentially reducing processing losses and improving the commercial value of harvested potatoes

Argentina has registered its first gene-edited potato variety, marking a milestone for agricultural biotechnology and demonstrating how targeted genetic changes can address quality losses across the food-processing chain.

Named OLI INTA, the variety was developed by the Agro-biotechnology Laboratory at the National Institute of Agricultural Technology (INTA) in Balcarce. It is designed to retain its colour after cutting and resist bruising caused by mechanical impacts during harvesting, transportation and storage.

Potatoes are an important raw material for both fresh consumption and industrial processing. However, bruising and internal discoloration can reduce their market value and render tubers unsuitable for processing, generating waste and eroding returns across the supply chain.

OLI INTA targets one of the principal causes of this deterioration: polyphenol oxidase, an enzyme responsible for enzymatic browning. Researchers used gene editing to inactivate the gene associated with the enzyme, limiting the formation of dark pigments in damaged tissue.

“Gene editing made it possible to inactivate the polyphenol oxidase gene, preventing the formation of dark pigments in damaged tissues,” said Gabriela Massa, an INTA and National Scientific and Technical Research Council (CONICET) researcher and member of the development team.

By reducing browning, the technology could help improve the quality of processed potato products and reduce the volume of raw material discarded during industrial processing, Massa said.

Gene editing targets losses from field to factory

Trials and evaluations found that OLI INTA did not develop subsurface bruising when tubers were subjected to impacts simulating those encountered during harvesting, transportation and storage, according to INTA.

The trait could help processors recover more usable material from harvested potatoes, reduce quality-related losses and improve the commercial value of production. Its practical impact will depend on performance under commercial handling conditions and adoption across the supply chain.

The development also illustrates the potential of gene editing to introduce specific traits into established crop varieties without incorporating genetic material from unrelated species.

Sergio Feingold, former coordinator of INTA's National Biotechnology Program, said the approach could change how breeders improve varieties that already perform well in production.

"This technology makes it possible to introduce qualities into varieties that are already successful in production, representing a fundamental change in the way potatoes are bred," Feingold said.

Beyond reducing browning and bruising, gene-editing technologies could help breeders develop crops with traits suited to changing environmental conditions and emerging pest and disease pressures.

Registration marks a regulatory milestone

OLI INTA has been entered in Argentina's National Cultivar Registry and National Register of Plant Variety Ownership, both administered by the National Seed Institute (INASE).

The project brought together researchers from INTA and CONICET, with support from initiatives including Procisur and Fontagro. Its development reflects collaboration between agricultural research institutions and production-sector priorities, particularly the need to limit losses and improve the quality of industrial raw materials.

According to the researchers, OLI INTA does not contain genetic information introduced from other species. In Argentina, it therefore follows the regulatory framework applicable to varieties developed through conventional breeding, rather than the pathway used for transgenic crops.

The registration comes as countries reassess how to regulate new genomic techniques in agriculture. Argentina's experience could offer a reference point for other Latin American markets considering the treatment of gene-edited crops.

Brazil is among the markets where similar technologies could find a favourable regulatory pathway, according to the source institution. Any wider commercial deployment, however, will depend on country-specific regulatory decisions and the variety's agronomic and processing performance.

For Argentina's potato sector, OLI INTA offers a targeted approach to a familiar industry problem: protecting quality between harvest and processing. Its broader significance lies in showing how gene editing can be applied to established crops to address measurable post-harvest losses.