



*Promoting Seed
Business in
the Americas*

*September 9 - 11, 2019
Buenos Aires, Argentina*

Public research at regional level: developments in the Southern Cone

Sergio Feingold





Platform to promote cooperation between INIAs and with IICA, to contribute to improve systemic competitiveness in a framework of social equity, environmental sustainability, food security, and stakeholders development of the Regional Agrifood and Agribusiness System (SAA)



ARGENTINA



BOLIVIA



BRASIL



CHILE



PARAGUAY



URUGUAY



IICA

July, 2017: Study Group on New Breeding Techniques

January, 2018: PROCISUR White Paper on Genome Editing

November, 2018: 1st Regional Course on Gene Editing of Plants and Animals

December, 2018: Publication of Regional Document (revista RIA)

2019: Support to FONTAGRO project on Genome Editing (*in preparation*)

29 de noviembre de 2018 / NOTICIA

Curso de Edición Génica en INTA Balcarse

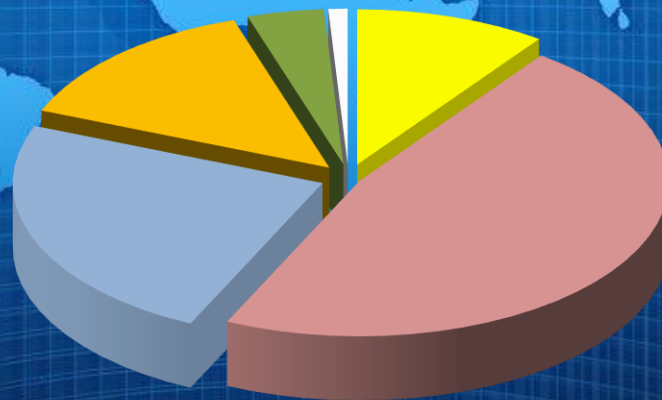


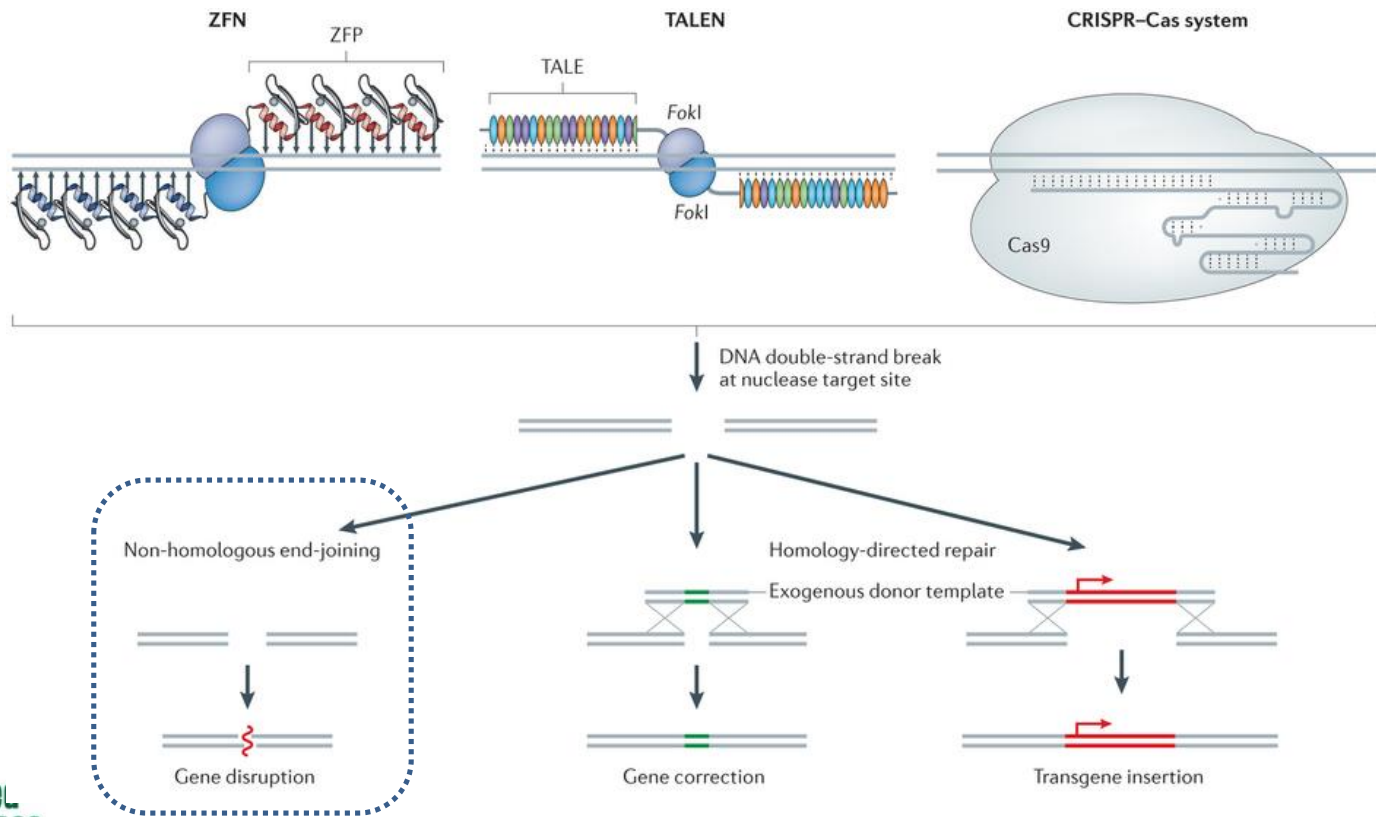
<http://ria.inta.gob.ar/contenido/edicion-genica-una-oportunidad-para-la-region>



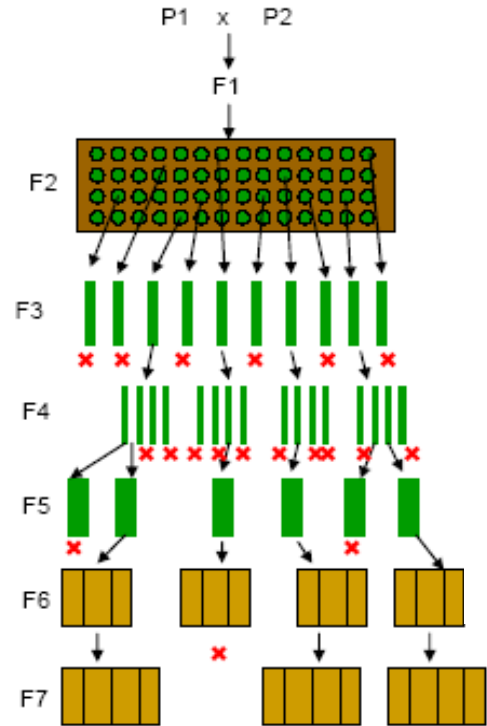
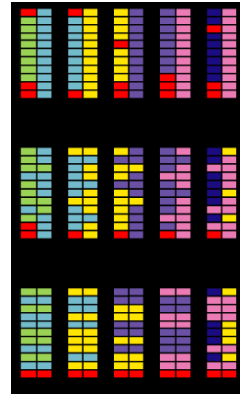
- Asia
- EEUU + Canada
- Brazil
- Argentina
- Paraguay Uruguay Bolivia
- Rest of the world

42 %





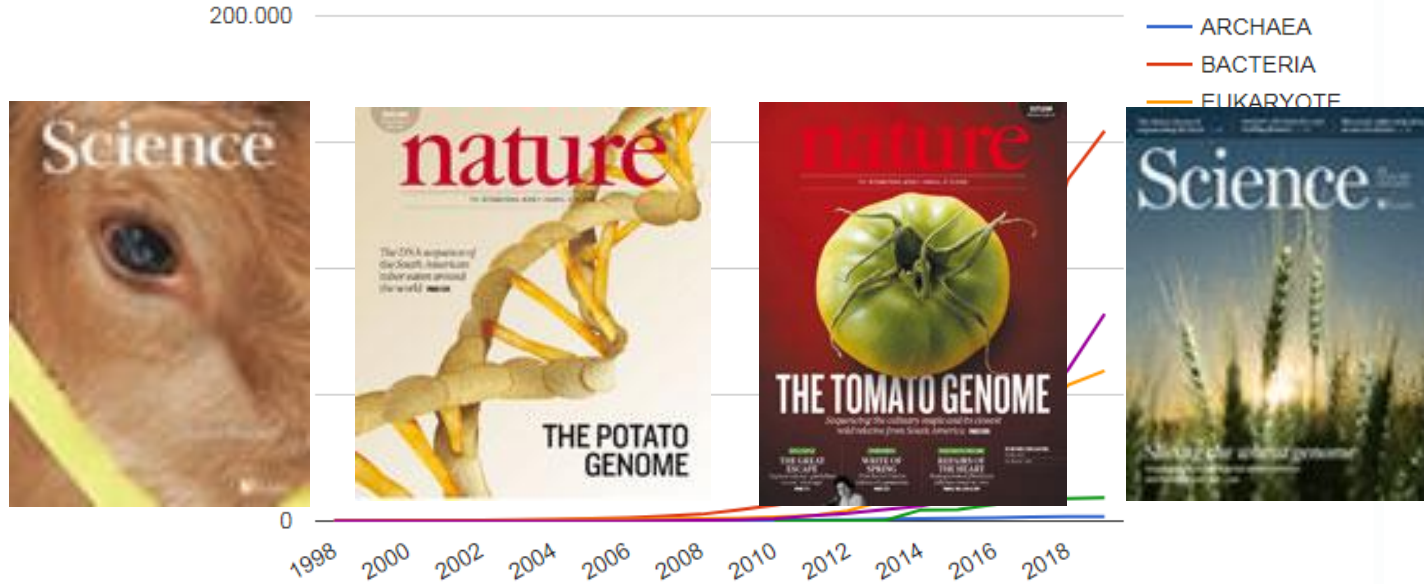
Domestication and "classic" breeding have been eliminating undesirable alleles and genes from genomes... but still



Considerations around Genome Editing

- Which gene, which sequence, in which sense?
- Genes, genomes, natural allelic diversity
- Genetic structure of crops:
 - self pollinated
 - hybrids
 - clonal

Projects by Domain



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Considerations around Genome Editing

Limitations

- Regeneration / Tissue culture
- Identification of edited events (except herbicide resistance 😊)
- Off-Target editions
- Delivery of GE machinery
 - transgenic approach (Back cross / transposons)
 - transient approach (RNPs/ plasmids): biobalistic / protoplasts / other
- Unintended insertions (plasmid delivery)

Considerations around Genome Editing

Limitations



Protoplasts regeneration and shoot genotyping



Considerations around Genome Editing

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Ongoing developments in the Region with Gene Editing

Potato: non-browning / resistant to cold induced sweetening /water use efficiency

Soybean: oil composition / k.o. of antinutritional compounds / herbicide resistance /

Soybean (*cont.*): Stay green under water stress / protein content /seed size / drought

Sugarcane: non-browning / herbicide resistance /biomass digestibility

Cotton: herbicide resistance / boll weevil resistance

Corn: Biomass digestibility

Tomato: high lycopene

Cattle: non - allergenic milk /heat stress / muscle increase

Capacity building at Regional level in both plants and animals /Bioinformatic Tools

GMO vs. Genome Editing

Benefits

- Healthier and better quality foods & feed
- Products more suitable for the industry
- Sustainability of production / industrialization
 - ✓ efficient use of resources
 - ✓ lower use of inputs/ (agro)chemicals
 - ✓ low impact industrialization
- Added value

Wrap up

- High potential technique for plant breeding
- Knowledge of genes, their functionality and natural allelic variation
- Incremental improvement for agamic / clonal crops
- Potentially with a non-restrictive regulation
- Can be directed to the benefit of the consumer / industry / sustainability
- Public acceptance (?)
- Possibility of multiple actors in development
- Intellectual property (?) techniques / products



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IICA

Thank you!

feingold.sergio@inta.gob.ar

