

California Seed Association Fact Sheet Series



Background

I hear a lot about GURTs. What are they and how are they used?

A GURTs stands for Genetic Use Restriction Technologies, which are transgenic technologies that control the viability of seeds or the expression of specific traits in plants.

Genetic Use Restriction Technologies (GURTs) is the name given to proposed methods for restricting the use or spread of genetically modified plants by causing the seeds to be non-viable. GURTs were developed to prevent the escape and reproduction of transgenic plants outside of cultivation and to provide intellectual property protection by preventing use of farmer-saved seeds of patented varieties. The broader applications of the underlying technology would be to control the expression of specific traits in specific generations, which would have many uses in plant breeding and crop production.

There are two kinds of GURTs: Varietal GURTs, which once triggered cause the seed to be normal in size but unable to germinate; and Trait GURTs, which when triggered cause the plants to express (or to stop expressing) a specific trait. In addition to preventing unauthorized propagation of proprietary varieties, Varietal GURTs could reduce propagation of volunteer plants in following crops and would prevent unwanted movement of crop plants into non-crop areas. Trait GURTs would be used to express a trait only at specific times or in response to an inducer compound, or to prevent the expression of the trait after the first growing season.

Although several methods to create and utilize GURTs have been demonstrated, none have been released in commercial varieties. The initial reports about the technology generated controversy and the pejorative term "terminator technology" was coined to describe it. Despite the many applications of GURTs that would be non-controversial and beneficial for farmers and the environment, the initial reaction has reduced interest in pursuing these technologies.

More Information

Convention on Biological Diversity (CBD) (<https://www.cbd.int/agro/gurts.shtml>)

International Seed Federation (ISF) ([http://www.worldseed.org/cms/medias/file/PositionPapers/OnSustainableAgriculture/Genetic_Use_Restriction_Technologies_20030611_\(En\).pdf](http://www.worldseed.org/cms/medias/file/PositionPapers/OnSustainableAgriculture/Genetic_Use_Restriction_Technologies_20030611_(En).pdf))

Canadian Food Inspection Agency (<http://www.inspection.gc.ca/english/plaveg/bio/gurtse.shtml>)

International Service for the Acquisition of Agri-biotech Applications (<http://www.isaaa.org/resources/publications/pocketk/21/default.asp>)

Sang et al. (2013) Gene use restriction technologies for transgenic plant bioconfinement. Plant Biotechnology Journal 116: 49-658 (<http://www.ncbi.nlm.nih.gov/pubmed/23730743>).

California  Seed
Association