

Species	Type of modification	Trait category	Trait	Designation/target
Plants	Centromere-mediated	Breeding technology	cytoplasmic male sterility	
Plum	Null-segregants from	Breeding technology		FasTrack technology
Setaria viridis	CRISPR-Cas9	Breeding technology	Delayed flowering time	Null-segregants of trans
Tobacco	Null-segregants from	Breeding technology	Early flowering (to accelerate breeding)	
Tobacco	Null-segregants from	Breeding technology	Early flowering (to accelerate breeding)	
Alfalfa	TALEN	Composition	Low lignin (improved nutritional quality)	
Camelina	CRISPR-Cas9	Composition	Increased oil content	C3008 (according to c
Maize	CRISPR-Cas9	Composition	Starch exclusively composed of amylose	CRISPR-Cas waxy corn
Maize	Meganuclease	Composition	Increased starch	
Pennycress	CRISPR-Cas9	Composition	Reduced erucic acid (NB not mentioned in application)	
Soybean	TALEN	Composition	High-oleic acid soybean	FAD2KO
Soybean	TALEN	Composition	High-oleic acid soybean	FAD3KO
Tobacco	Meganuclease	Composition	Nicotine-free	
Wheat	TALEN	Composition	High-fiber (not mentioned in application)	
Maize	CRISPR-Cas9	Disease resistance	Northern Leaf Blight	CRISPR-Cas
Plasmids	Transient expression	Disease resistance	antifungal (application)	TraitUp-FB100
Rice	TALEN	Disease resistance	Resistance to bacterial blight	Ting-1 to -5
Wheat	TALEN	Disease resistance	Mildew resistance	MLO_KO Wheat
Canola	Oligonucleotide-directed	Herbicide tolerance	Tolerance to tribenuron-methyl	5715
Canola	Site-directed mutagenesis	Herbicide tolerance	Tolerance to imazapyr	CLB-1
Organisms	Zinc finger nuclease	Modification technique	Technology per se to induce	induced double-strand breaks
Plants	Meganuclease	Modification technique		MGN1 (targeted genome editing)
Mushroom	CRISPR-Cas9	Quality	anti-browning	CRISPR-Cas9-edited mushroom
Potato	TALEN	Quality	Enhanced product quality (not further specified)	
Potato	TALEN	Quality	Reduced black spot	TALEN PPO_KO
Potato	TALEN	Quality	Reduced black spot	TALEN PPO5
Tomato	CRISPR-Cas9	Quality	Lack of pedicel abscission	17854, 18001
Soybean	CRISPR-Cas9	Stress tolerance	Drought and salt tolerance	590-4-28-5
Soybean	Epigenetic reprogramming	Stress tolerance	Modulation of defence and stress responses	
Soybean	Epigenetic reprogramming	Stress tolerance	Modulation of defence and stress responses	
Maize	CRISPR-Cas9	Unknown	Unknown	#4, #6
Maize	Meganuclease using	Yield	enhanced photosynthesis	Hi-Yield Maize
Maize	Unknown ("genome editing")	Yield	increased yield	BHB ISY
Plants	Epigenetic effect in	Yield	biomass, growth rate, yield, height, and other traits	

Petitioner (website)	Country	Authority	Status	Year	Description (website)
New Zealand Institute USDA ARS	USA USA	USDA APHIS USDA APHIS	de-regulated de-regulated	2011 2011	CCE GE Plant Null Segregant Plum
Donald Danforth Plan North Carolina State U Arnold and Porter, LLI	USA USA USA	USDA APHIS USDA APHIS USDA APHIS	de-regulated de-regulated de-regulated	2017 2011 2015	CRISPR-Cas9-mutagenesis Null Segregant Tobacco Tobacco Varieties Group
Calyxt, Inc. Yield10 Bioscience DuPont Pioneer Agrivida, Inc. Illinois State University Cellecitis Plant Science Cellecitis Plant Science North Carolina State U Calyxt, Inc.	USA USA USA USA USA USA USA USA	USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS	de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated	2017 2017 2016 2015 2018 2015 2015 2017 2018	Alfalfa with Improved Genome Edited Camelina Waxy Corn Development Maize Genetically Engineered Genome Edited Penn State FAD2KO Soybean FAD3KO Soybean Tobacco with Low Lignin Nutritionally-Enhanced
DuPont Pioneer Rutgers University Iowa State University Calyxt, Inc.	USA USA USA USA	USDA APHIS USDA APHIS USDA APHIS USDA APHIS	de-regulated de-regulated de-regulated de-regulated	2018 2014 2015 2016	Corn with Improved GE TraitUP (TM)-FB1 Ting-1 to Ting-5 Rice MLO_KO Wheat
Cibus BASF	Canada Canada	CFIA CFIA	plant with novel trait plant with novel trait	2013 2014	
Dow AgroScience Cellecitis S.A./Celleciti Penn State Cellecitis Plant Science Calyxt, Inc. Simplot Plant Science University of Florida USDA ARS University of Georgia Epicrop Technologies, USA Iowa State University Benson Hill Biosystem Benson Hill Biosystem University of Nebrask	USA USA USA USA USA USA USA USA USA USA USA USA USA USA USA	USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS USDA APHIS	de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated de-regulated	2012 2011 2016 2014 2016 2016 2018 2017 2018 2017 2018 2015 2018 2012	Organisms modified I-Crel Meganuclease CRISPR-edited Mushroom GE Null Segregant Potato TALEN PPO_KO Potato TALEN PPO5 Potato Genome Edited Tomato Soybean with Drought Soybean Engineered Null Segregant Soybean Genome Edited Maize BHB Hi-Yield Maize Corn with Increased Null Segregant (NS) F

Target

pFT gene from poplar (encoding the Flowering locus T-like protein)
ID1 homologue (2nd exon, Sevir.9G247100, single guide RNA36003-2)
FT gene (from *Arabidopsis thaliana*); NPTII marker gene
FT gene (early flowering)
[Confidential Business Information] (knock-out)
C3008
Wx1 (Waxy)
(maize phosphorylating enzyme gene not further specified)
fae1-4 (fatty acid elongase)
FAD2-1A and FAD2-1B fatty acid desaturase 2 (FAD2) genes
fatty acid desaturase 3 (1st exon)
BBL, berberine bridge enzyme-like
ed Wheat Developed by TALEN Technology
NLB-18
00 Plasmids Without Plant Pest Sequences
two disease susceptibility gene promoters (OsSWEET14 = Os11N3; OsSWEET11 = Os8N3), turning tl
Mildew Resistance Locus gene
BnAHAS-1
AHAS-3
using their zinc finger technology (EXACT) (TM)
I-CreI meganuclease from *Chlamydomonas reinhardtii* is used
polyphenol oxidase gene (ppo)
potato
Ppo
Ppo5
J2 [MADS-Box transcription factor (Solyc12g038510)]
double-stranded RNA binding protein2 (Drb2a, Drb2b)
Msh-1 (MutS homologue 1)
Msh-1 (MutS homologue 1)
ze Developed with CRISPR/Cas technology

Yield

MUTS homologue 1 (Msh1) both sense and antisense fragments from *Sorghum bicolor* separated b

these genes into resistance genes

by an intron, RNAi-silenced, transgene removed via segregation