Food Futures: Commercialisation of Gene Edited Crops in Asia and Australia

Gene Editing Policy in APAC – impact on commercialisation

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Current global Agricultural and food exports
Global registrations are essential to commercialisation due to grain trade.

Markets for GM soybean commercialization

Markets with GM soybean imports only

2016 Soybeans Imports (million Metric Tons)
China – 83.9
EU – 15.0
Mexico – 4.3
Japan – 3.2
Taiwan – 2.3
Korea – 1.4
Products Completing USDA “Am I Regulated” Process

**Crop** | **Year** | **Company/University**
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Soybean modified composition | 2019 | Univ. of Wisconsin
Edited [non-browning] lettuce | 2019 | Indiana State University
Altered product quality Camellia | 2018 | USDA-ARS
Modified oil crops, field perennial (F. americana (L) [24]) | 2010-2020 | Illinois State University / Covestro
"Stemless" Tomato | 2018/2020 | University of Florida
Increased yield Maize | 2018 | Benson Hill Biosystems
High fiber/Wheat 1 | 2018 | Cabot
Northern Leaf Night (Nal) Resistant Crops | 2018 | DelMonte Foods (Lipton)
Strengthened Soybean | 2017 | USDA-ARS
Low Igon-Knock out White | 2017 | Cabot
Extra-long producing gene-edited Camellia | 2017-2020 | Yibinke Bioscience
Petunia (P. hybrida) w. dehyd flowering | 2017 | StarNorth Plant Sci. Center
Non-browning Potato | 2015 | Smithfield Foods
Non-browning Potato | 2015 | Cabot
Waxy Corn (high amylopectin) | 2014 | DelMonte Foods (Lipton)
Wheat with pyramided resistance | 2015 | Cabot
Non-browning mushroom | 2015 | Pure-Taste
Corn with elevated leaf / stalk starch accumulators | 2014 | Agrivida
Waxy resistant to bacterial leaf blight | 2014 | Iowa State University
Soybean with elevated oleic acid levels (2): | 2015 | Cabot
Potato with increased cold storage | 2014 | Cabot

**Crop** | **Year** | **Company/University**
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High Oleic Canola | 2020 | Calyxt
Reduced-pool-saturaing Canola | 2020 | Calyxt
Tomato modified for urban farming | 2020 | Gold Spring Harbor Labs
Tomato with increased GABA | 2020 | Sensata Tech
Canola with altered oil content | 2020 | Mabud Bioeconomics
Phenolic w. improved flavor | 2020 | Pedmara
Edited [darkened browning] Avocado | 2020 | Green Yamas LLC
Non-browning [low FFQ] Avocado | 2020 | Sogol
Strawberry with extended shelf life | 2020 | Sogol
Edited Maize/Soybean/Tomato (3) | 2020 | Inert Ag.
Potato with modified composition/fortification/iodine (4) | 2020 | Sogol
Altered inside Microflora | 2020 | Winemnem Inst. Of Science
Improved quality Barley | 2020 | Oregon State Univ.
High oleic Soybean | 2020 | Toffleem
Improved flavor Pea | 2020 | Benson Hill
High oleic/low linolenic Soybean | 2020 | Calyxt
Rice with herbicide resistance | 2020 | Calyxt
Flax with herbicide resistance | 2020 | Calyxt
Petunia with modified color | 2020 | Toffleem
SCN resistant Soybean (2) | 2020 | Eversense
Edited tomato lacking and sugar | 2020 | Michigan State Univ.
Citrus tolerant to Citrus Cancer | 2020 | Toffleem

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Madai Red Sea Bream from Regional Fish Co., Ltd., together with the Kyoto University and Kinki University
Companies involved in GE crops – US
Regulatory environment for plant products
An increasing number of countries have reviewed or are in the process of revision of their biotech/GMO regulations

US USDA SECURE:
• Self-determination (limited)
• Case-by-case consultation

US EPA On going consultations

Canada
Case by case review of regulatory status

LATAM:
• Case-by-case exclusions for certain products
• Short decision timelines

AUS, JP:
• Exclusion of certain products (KO; “simple mutants” / SDN1)

Certain products excluded from GMO regulation
Under GMO regulation and ongoing review
Under GMO regulation
Global gene editing regulatory policies

North & South America

Unregulated

APAC

Regulated

Europe
Current policies in APAC

With exemptions
- Australia (OGTR, FSANZ)
- Japan (MHLW, MAFF)
- Philippines (BPI)
- Singapore
- Indonesia

No defined policy
- Taiwan
- India
- Thailand
- Vietnam

Currently captured in regulations
- China
- Korea
Regulatory Policy and Trade

• Regulatory harmonisation of gene edited crops is crucial
• Without regulatory harmonisation the agricultural industry faces the same trade issues that have been plaguing us for decades since the first commercialisation of GM crops.
• The majority of the world is coming to the rational approach applying the principle that like products should be regulated similarly.
• Countries holding out are because of anti GM activist pressure rather than because they disagree with the science.
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