

# How Innovation and Technical Trade Restrictions Impact Global Food Prices? Focus on Biotech

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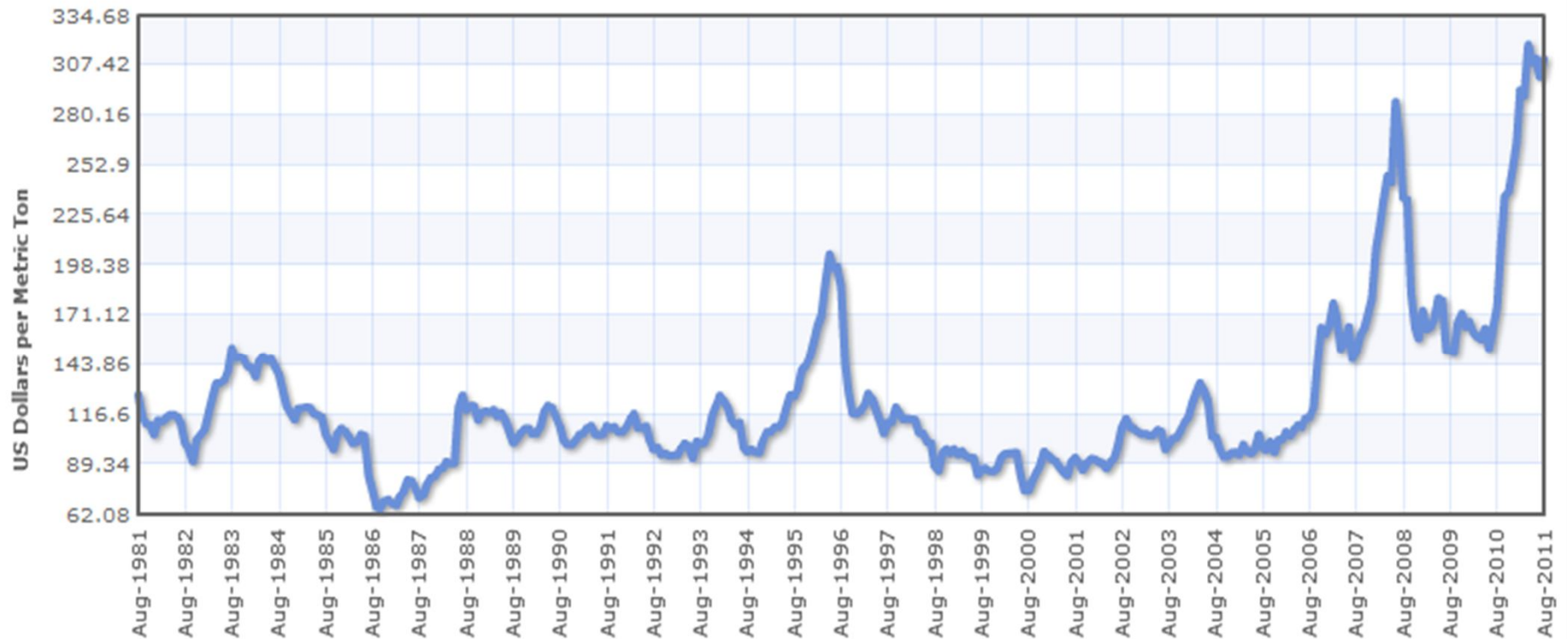
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# Food prices: drivers and trends

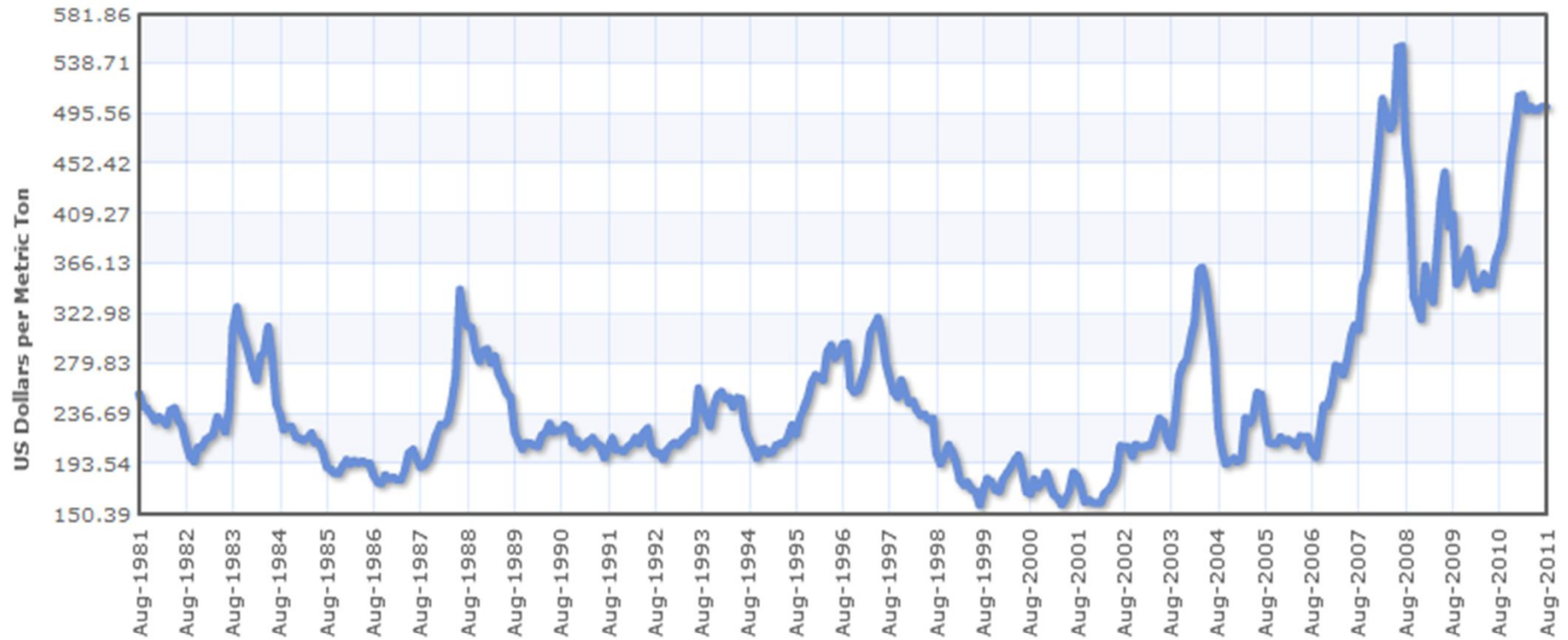
# Monthly maize prices, 1980 to Aug 2011 (in current \$US/mt)



Source: CRB

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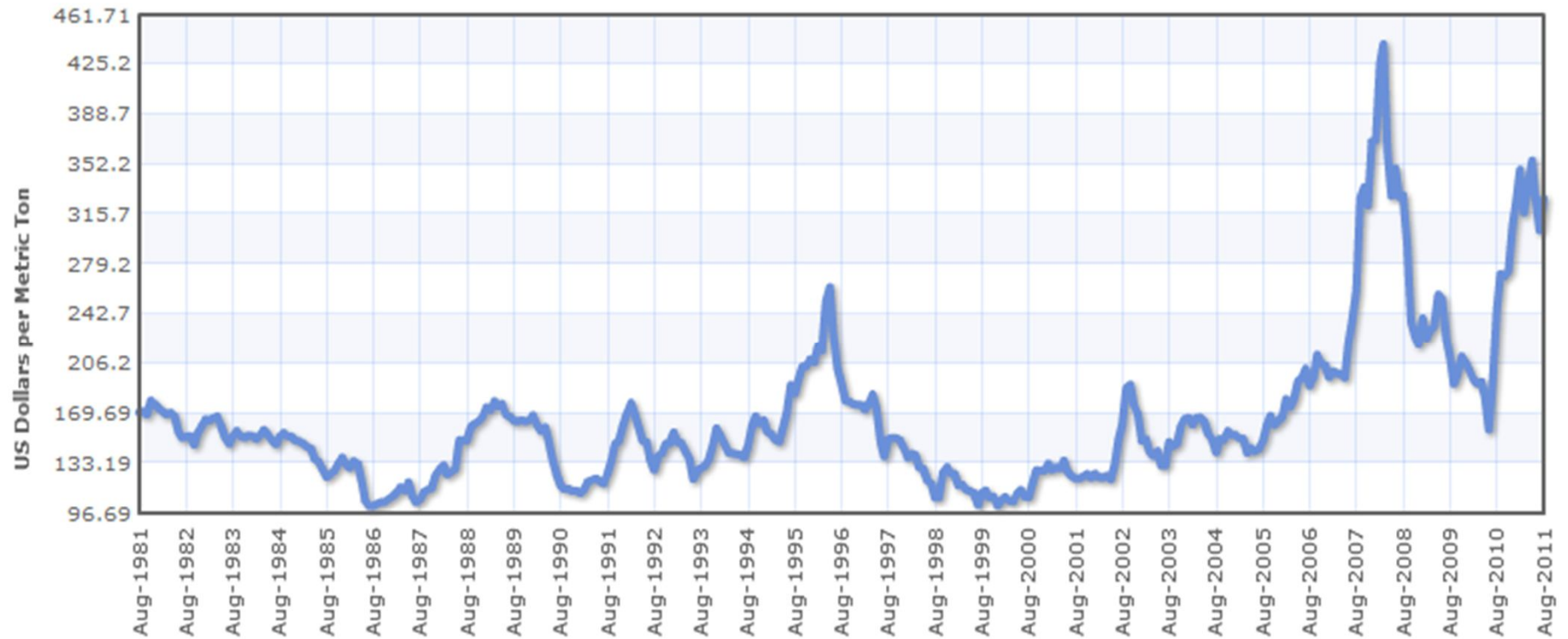
# Monthly US soybean prices, 1980 to Aug 2011 (in current \$US/mt)



Source: CRB

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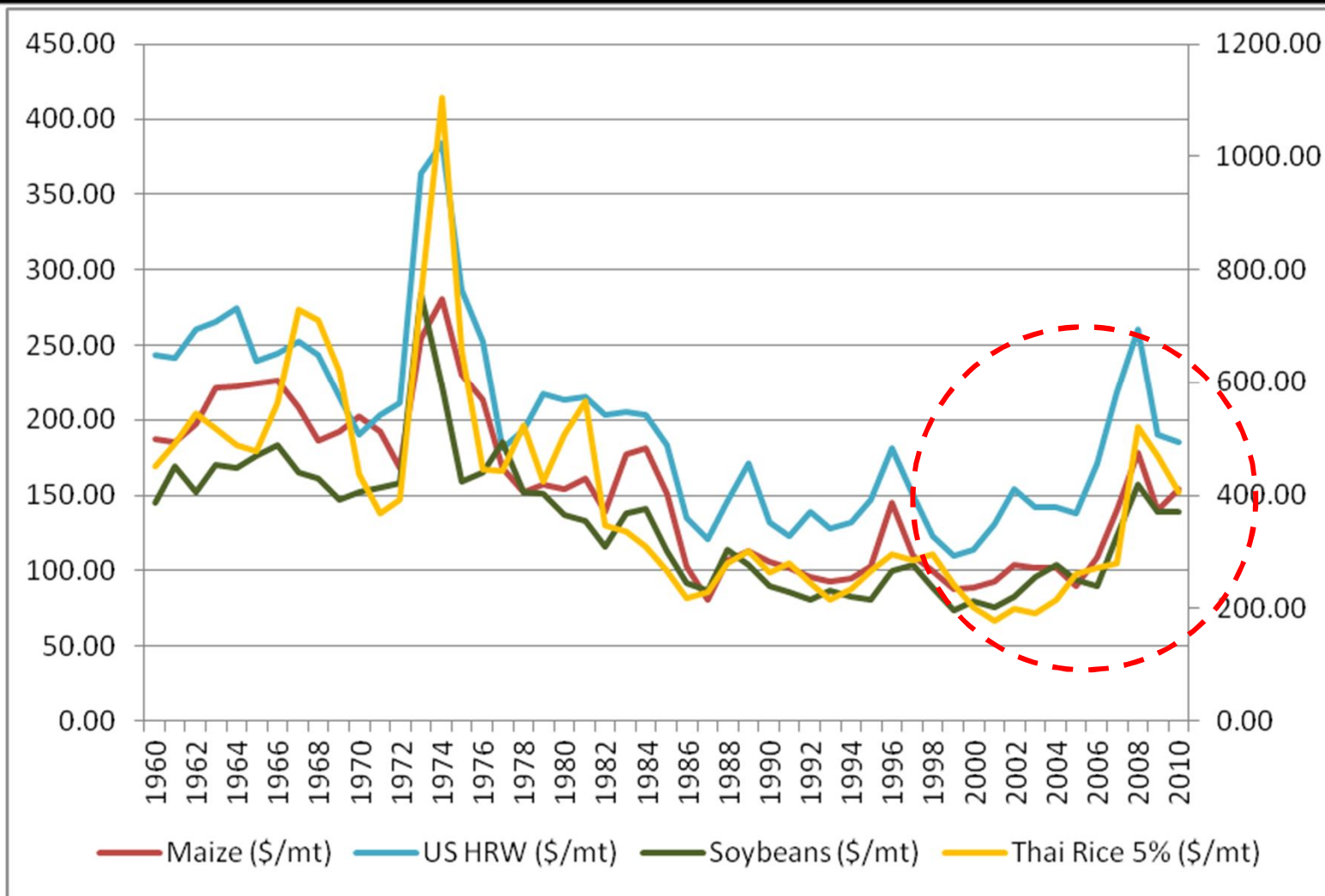
# Monthly US wheat prices, 1980 to Aug 2011 (in current \$US/mt)



Source: CRB

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# Annual real commodity prices, 1960-2010 (in 2000 \$US/mt)



Source: World Bank

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# Drivers of price increases and the role of technology and trade

- A number of structural (demand and supply) factors have contributed to food price increases over the last decade
- **Innovation**, productivity growth and **trade** can temper price increases and volatility and government policies should pay attention to both
- ***Biotech in focus*** here due to its scope for sustained productivity growth and potential impact on agricultural commodity trade



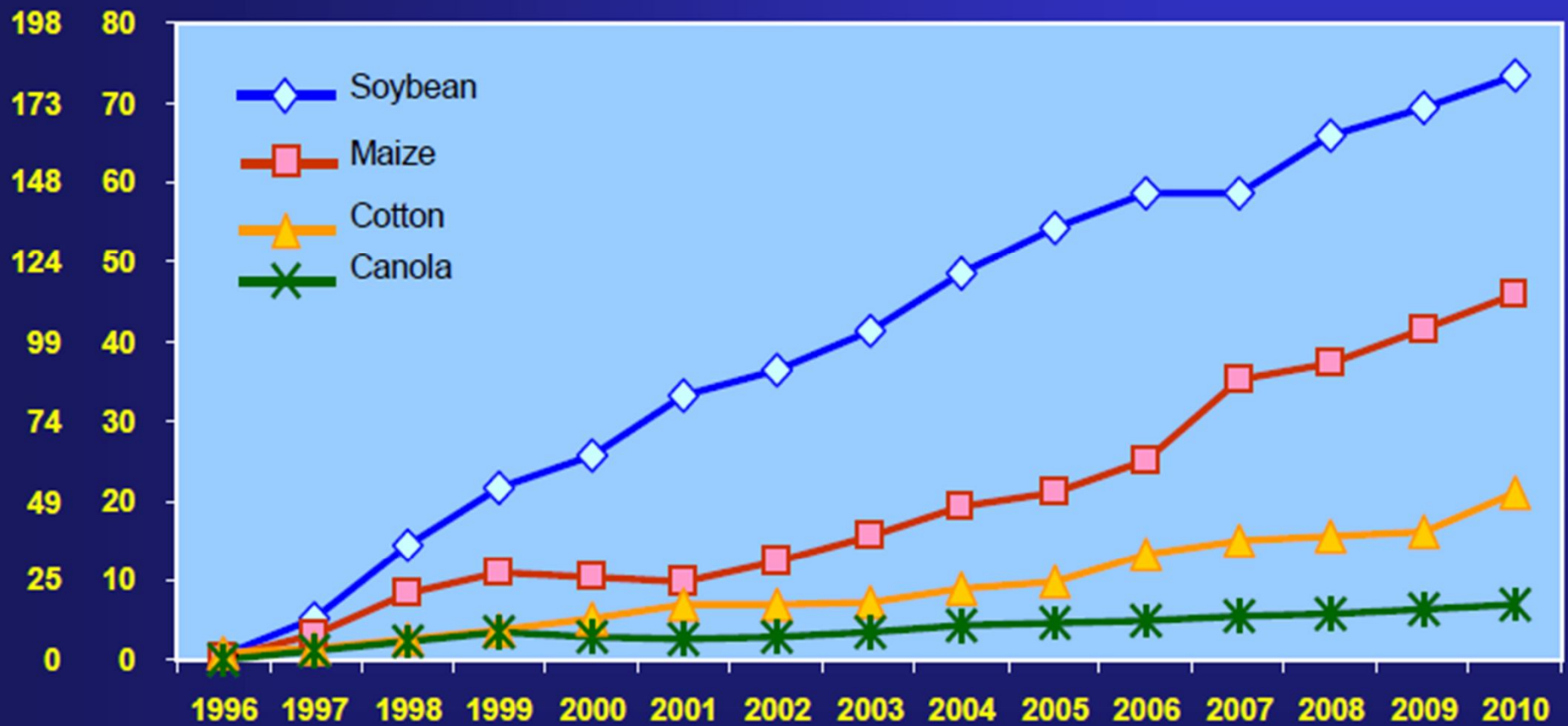
# **Impact of biotech on agricultural commodity prices**

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# Global biotech adoption 1996-2010

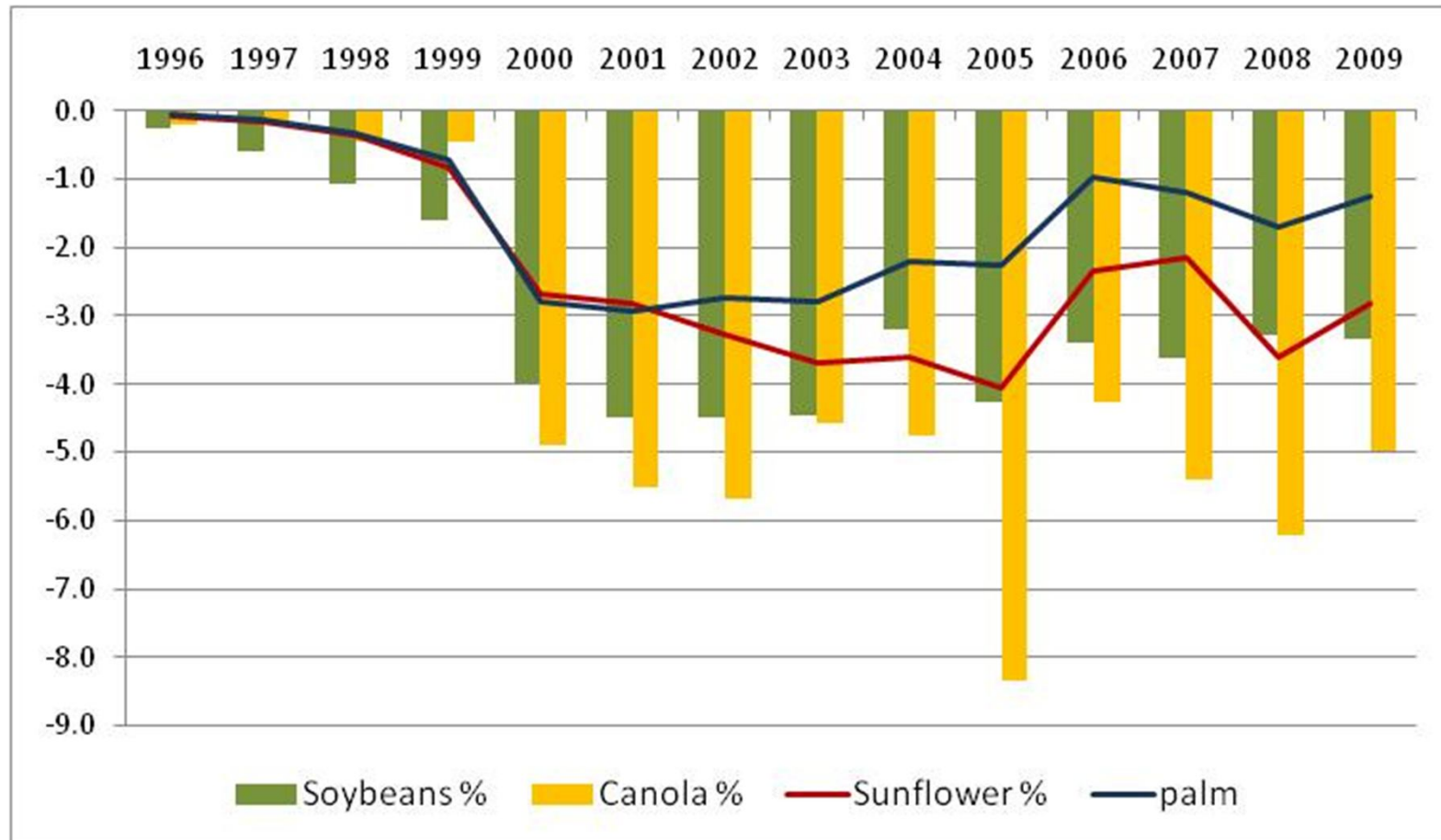
M Acres



Source: Clive James, 2010

# Biotech adoption has led to expansion of supplies and lower commodity prices

## Example: Impact of biotech on prices of various oilseeds

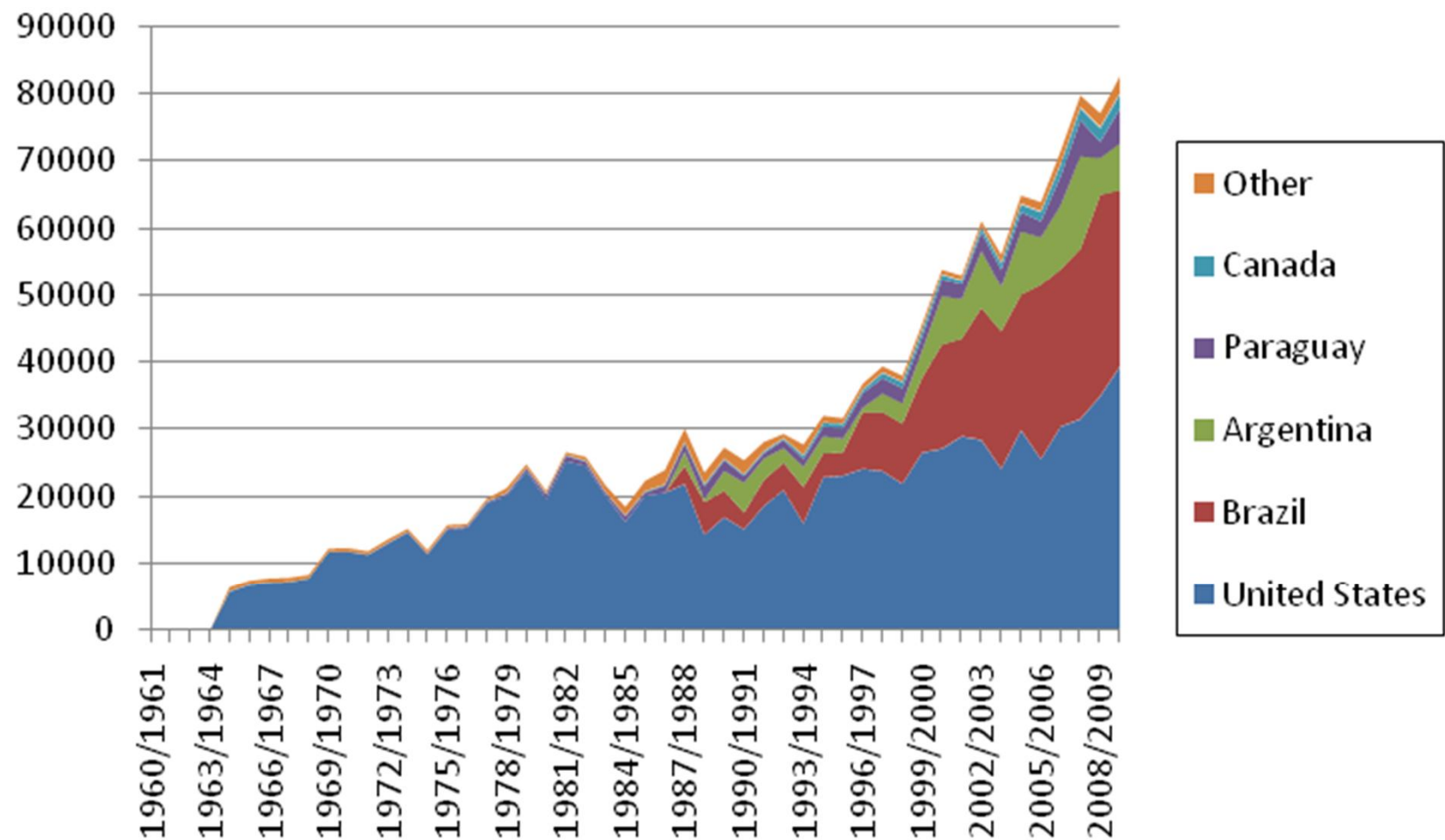


Source: Kalaitzandonakes, Alston and Kruse, 2011 (preliminary results)

# **Transfer of biotech benefits through trade**

# Key soybean exporting countries

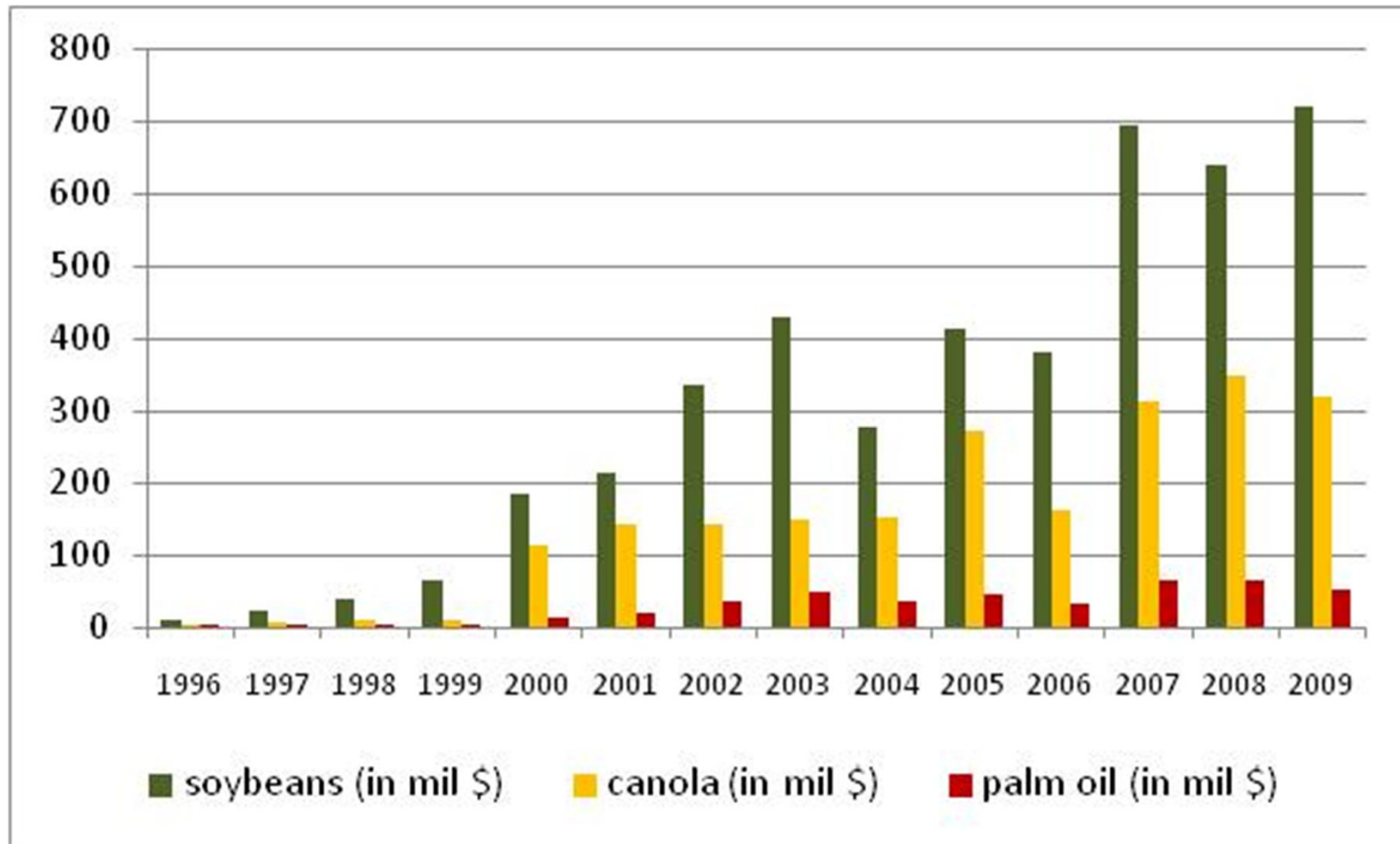
Biotech adopters export more than 95% of soybeans traded in international



Source: based on USDA data

# Biotech benefits through trade – relative size

## Example: Biotech impacts on China's oilseed markets



Source: Kalaitzandonakes, Alston and Kruse, 2011 (preliminary results)



# **Potential impacts of trade disruptions from regulatory asynchronicity & LLP**

# Asynchronicity: What's the problem?

## Biotech Pipeline, Regulation and Trade

- Because the biotech pipeline has been expanding and the biotech regulatory systems and approvals in different countries have become less synchronized
- “Zero tolerance” policies for asynchronously approved GMOs imply zero trade
- Bilateral trade disruptions due to regulatory asynchronicity can be costly both to importing and exporting countries

# Potential economic impacts of asynchronicity & LLP on China

*source: J. Huang and J Yang, 2011*

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# 3 approved GM soybean events in China and 13 events approved in the USA

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**Approved by China marked in red; all events approved by USA**

- 1 Roundup Ready™ (OECD Identifier: MON-Ø4Ø32-6)**
  - 2 Genuity Roundup Ready 2 Yield™ (OECD Identifier: MON-89788-1)**
  - 3 LibertyLink™ (OECD Identifier: ACS-GMØØ5-3)**
  - 4 LibertyLink™ (OECD Identifier: ACS-GMØØ6-4)
  - 5 Cultivance™ (OECD Identifier: BPS-CV127-9)
  - 6 Optimum™ GAT™ (OECD Identifier: DP-356Ø43-5)
  - 7 TREUS™ (OECD Identifier: DP-3Ø5423-1)
  - 8 MON87701 (OECD Identifier: MON-877Ø1-2)
  - 9 MON87705 (OECD Identifier: MON-877Ø5-6)
  - 10 DuPont (lines: DD-Ø26ØØ5-3, DD-Ø26ØØ5-3, DD-Ø26ØØ5-3)
  - 11 LibertyLink™ (OECD Identifier: ACS-GMØØ4-2)
  - 12 LibertyLink™ (lines: ACS-GMØØ2-9, ACS-GMØØ1-8)
  - 13 LibertyLink™ (OECD Identifier: ACS-GMØØ3-1)
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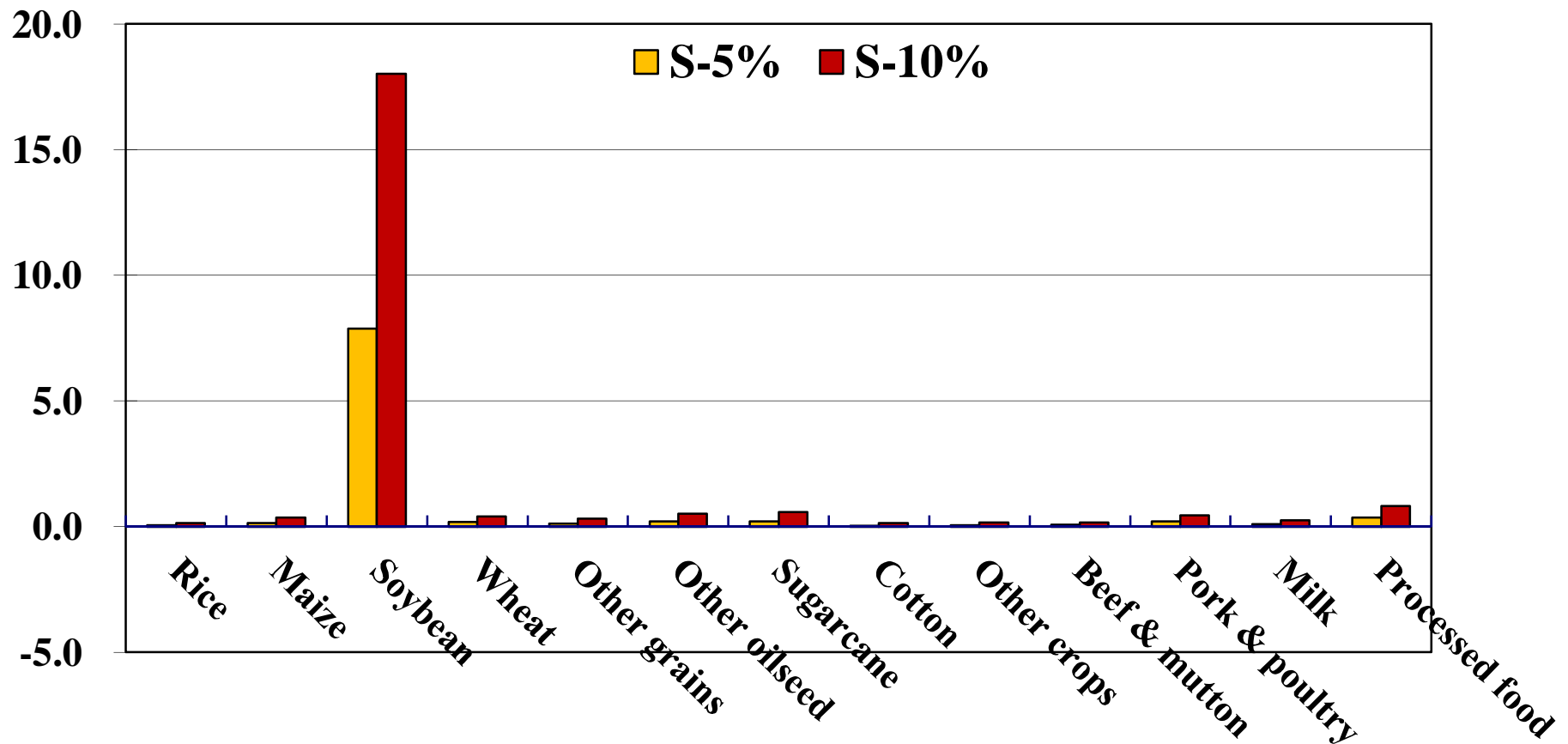
# 12 GM maize events approved in China

1	<b>Agrisure CB Advantage™, Agrisure™ CB/LL (OECD Identifier: SYN-BTØ11-1)</b>
2	<b>KnockOut™, NatureGard™ (OECD Identifier: SYN-EV176-9)</b>
3	<b>Roundup Ready™, Agrisure GT™ (OECD Identifier: MON-ØØØ21-9)</b>
4	<b>Herculex I™ (OECD Identifier: DAS-Ø15Ø7-1)</b>
5	<b>Herculex RW™ (OECD Identifier: DAS-59122-7)</b>
6	<b>LibertyLink™ (OECD Identifier: ACS-ZMØØ3-2)</b>
7	<b>Agrisure RW™ (OECD Identifier: SYN-IR6Ø4-5)</b>
8	<b>YieldGard™, MaizeGard™ (OECD Identifier: MON-ØØ81Ø-6)</b>
9	<b>YieldGard Rootworm™, MaxGard™ (OECD Identifier: MON-ØØ863-5)</b>
10	<b>LibertyLink™ (OECD Identifier: DKB-8979Ø-5)</b>
11	<b>Roundup Ready 2™ (OECD Identifier: MON-ØØ6Ø3-6)</b>
12	<b>phytase B23 (OECD Identifier: line: B23-3-1)</b>

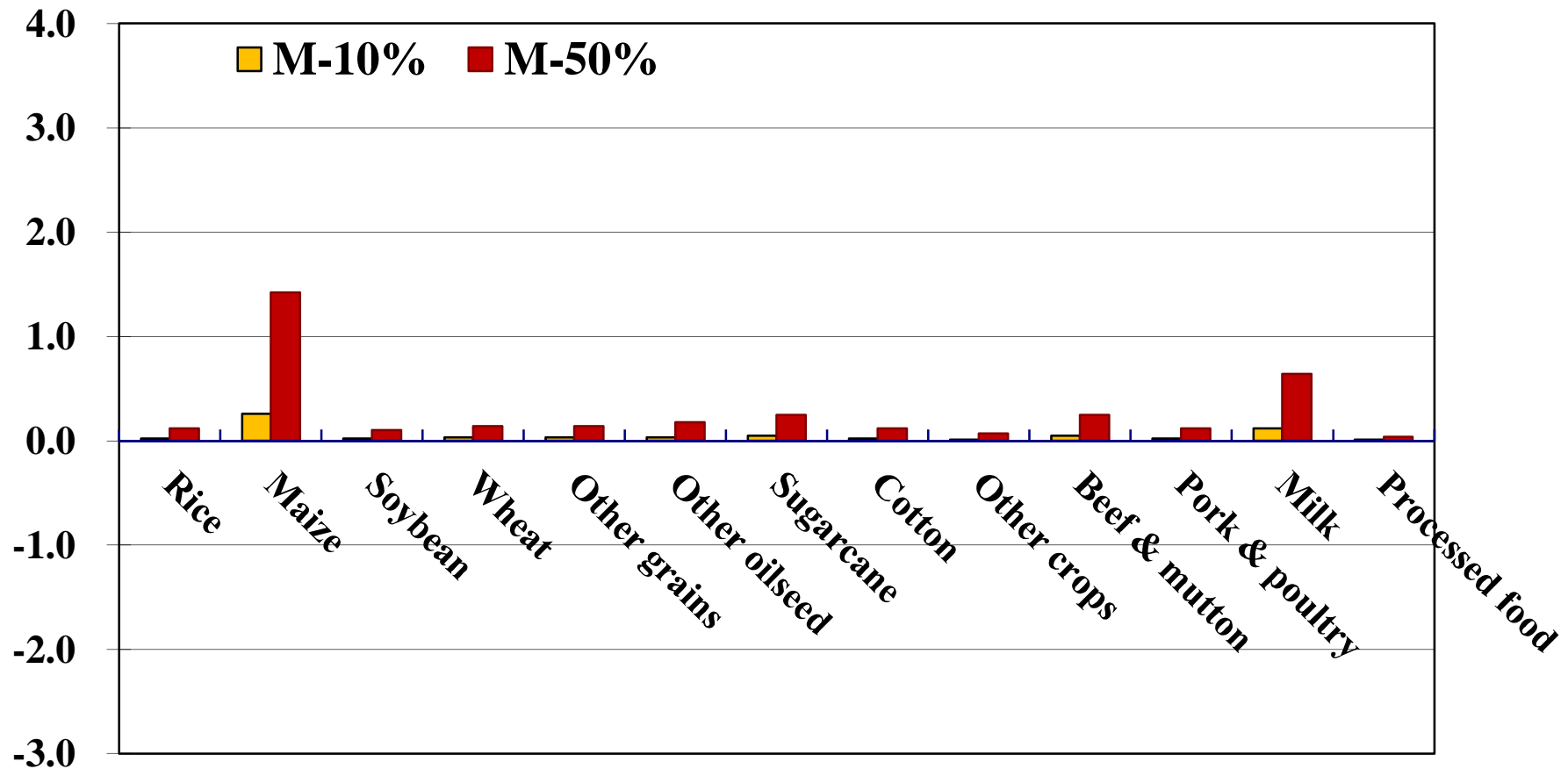
# 18 GM maize events not yet approved in China but approved in the USA

1	<b>YieldGard VT Pro™ (OECD Identifier: MON-89Ø34-3)</b>
2	Enogen™ (OECD Identifier: SYN-E3272-5)
3	Optimum™ GAT™ (OECD Identifier: DP-Ø9814Ø-6)
4	Mavera™ (OECD Identifier: REN-ØØØ38-3)
5	<b>Agrisure Viptera™ (OECD Identifier: SYN-IR162-4)</b>
6	MON87460 (OECD Identifier: MON-8746Ø-4)
7	YieldGard VT RW™ (OECD Identifier: MON-88Ø17-3)
8	Bt-Xtra™ (OECD Identifier: DKB-89614-9)
9	LibertyLink™ (OECD Identifier: ACS-ZMØØ2-1)
10	StarLink™ (OECD Identifier: ACS-ZMØØ4-3)
11	YieldGard™ (OECD Identifier: line: MON801)
12	YieldGard™ (OECD Identifier: MON-8Ø2ØØ-7)
13	MON809 (OECD Identifier: PH-MON8Ø9-2)
14	Roundup Ready™ (OECD Identifier: line: MON832, MON831, MON830)
15	SeedLink™ (OECD Identifier: ACS-ZMØØ1-9)
16	SeedLink™ (OECD Identifier: ACS-ZMØØ5-4)
17	Pioneer MS (OECD Identifier: PH-ØØØ676-7, PH-ØØØ678-9, PH-ØØØ68Ø-2)
18	TC 6275 (OECD Identifier: DAS-Ø6275-8)

# Impacts on Prices of China's Ag Commodities under different scenarios of soybean import restrictions in 2010 (relative to baseline, %)



# Impacts on Prices of China's Ag Commodities under different scenarios of maize import restrictions in 2010 (relative to baseline, %)



# Potential economic impacts of asynchronicity & LLP on the EU

*source: Kalaitzandonakes, Miller and Kauffman, 2011*

# Supply and price impacts on EU maize sector

Country/Region	Difference in Supply	Difference in Demand	Difference in Price
EU27	1.8%	-1.7%	4.7%
BRZ	-0.3%	0.3%	-0.7%
ARG	-1.0%	3.4%	-4.1%
USA	-0.5%	0.6%	-1.2%
CHN	-0.2%	0.2%	-0.4%
PAR	0.0%	0.0%	0.0%
CAN	-0.2%	0.2%	-0.5%
MEX	-0.2%	0.2%	-0.3%
BUR	1.5%	-3.3%	3.6%
WBA	2.0%	-2.7%	3.7%
REU	1.6%	-1.9%	4.8%
RUB	1.9%	-2.4%	4.0%
UKR	1.4%	-2.1%	3.4%
CAM	-2.3%	1.5%	-5.3%
VEN	-2.0%	1.8%	-4.5%

# Supply and price impacts on EU soybean complex

Commodity	Difference in Supply	Difference in domestic supply	Difference in Price
Soybeans	-7.73 MMT	+0.48 MMT	+220%
Soy meal	-18.91 MMT	-4.89 MMT	+211%
Soy oil	-0.84 MMT	+0.017 MMT	+202%



# Concluding Comments

- Structural factors and some new constraints (e.g. climate change) will likely continue to pressure global food prices
- Biotech and other innovations will need to keep supply growth rates in line with demand ones and, along with trade, prices at sustainable levels
- Regulatory asynchronicity and zero tolerance would impact trade like any other technical barriers
- Attention to LLP policies and regulatory synchronicity deserve strong attention