CropLife
CANADA

Plant Breeding Innovations:

Supporting Sustainable Agriculture

REPRESENTING THE CANADIAN DEVELOPERS, MANUFACTURERS AND DISTRIBUTORS OF PEST CONTROL PRODUCTS AND PRODUCTS OF MODERN PLANT BREEDING.

The benefits of plant science innovations

- Pesticides and plant biotechnology deliver a full mix of economic, environmental and social benefits for Canadians
- Farmers grow more on less land, protecting the environment, driving economic activity and helping keep food costs affordable

ENVIRONMENT

How is the plant science industry helping Canada's farmers take care of the environment?

Protecting biodiversity

- Without pesticides and biotechnology farmers would need to turn 35 million more acres into farmland to grow what they do today
  - That's more than the total area of New Brunswick, Nova Scotia and P.E.I. combined!

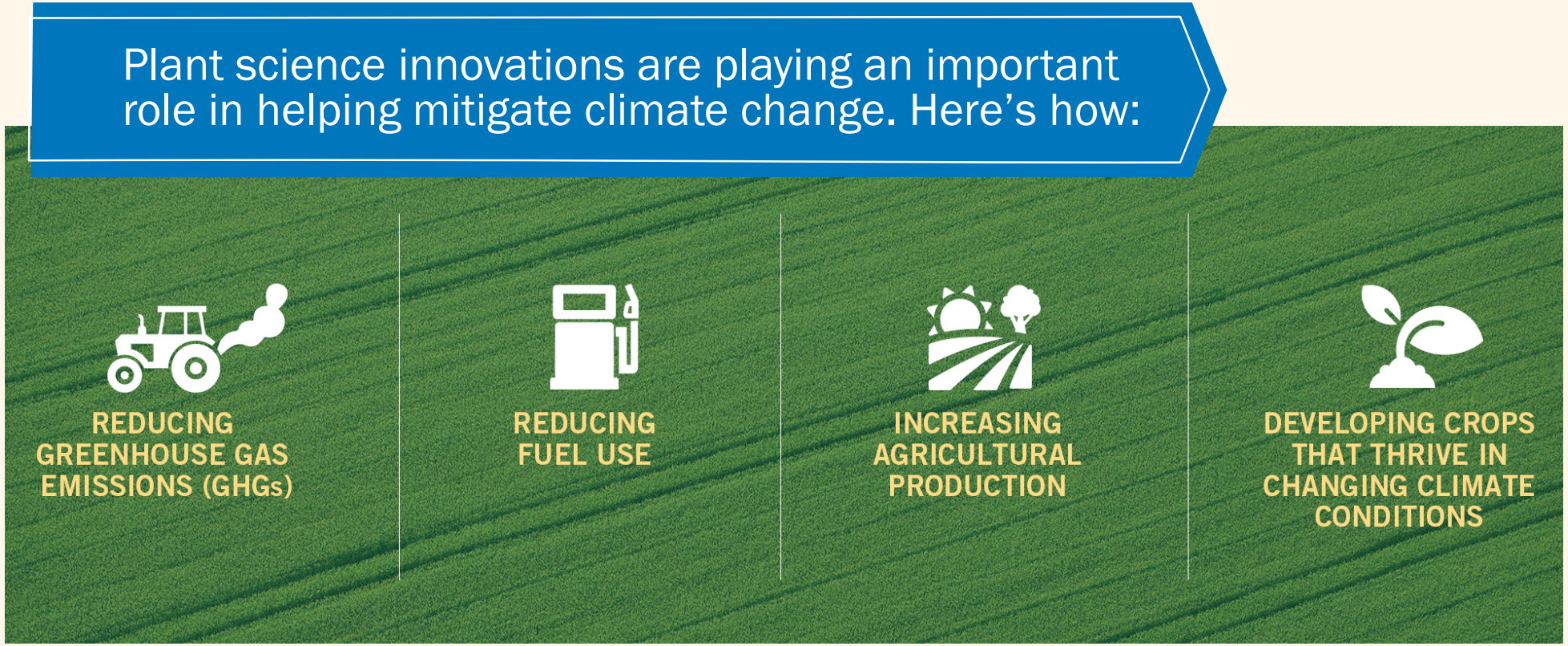
Saves natural habitat from being turned into farmland

Saving fuel and water

- Conservation tillage reduces soil erosion, improves soil quality and cuts water use
- Fewer trips over the fields with equipment saves up to 194 million litres of diesel fuel a year

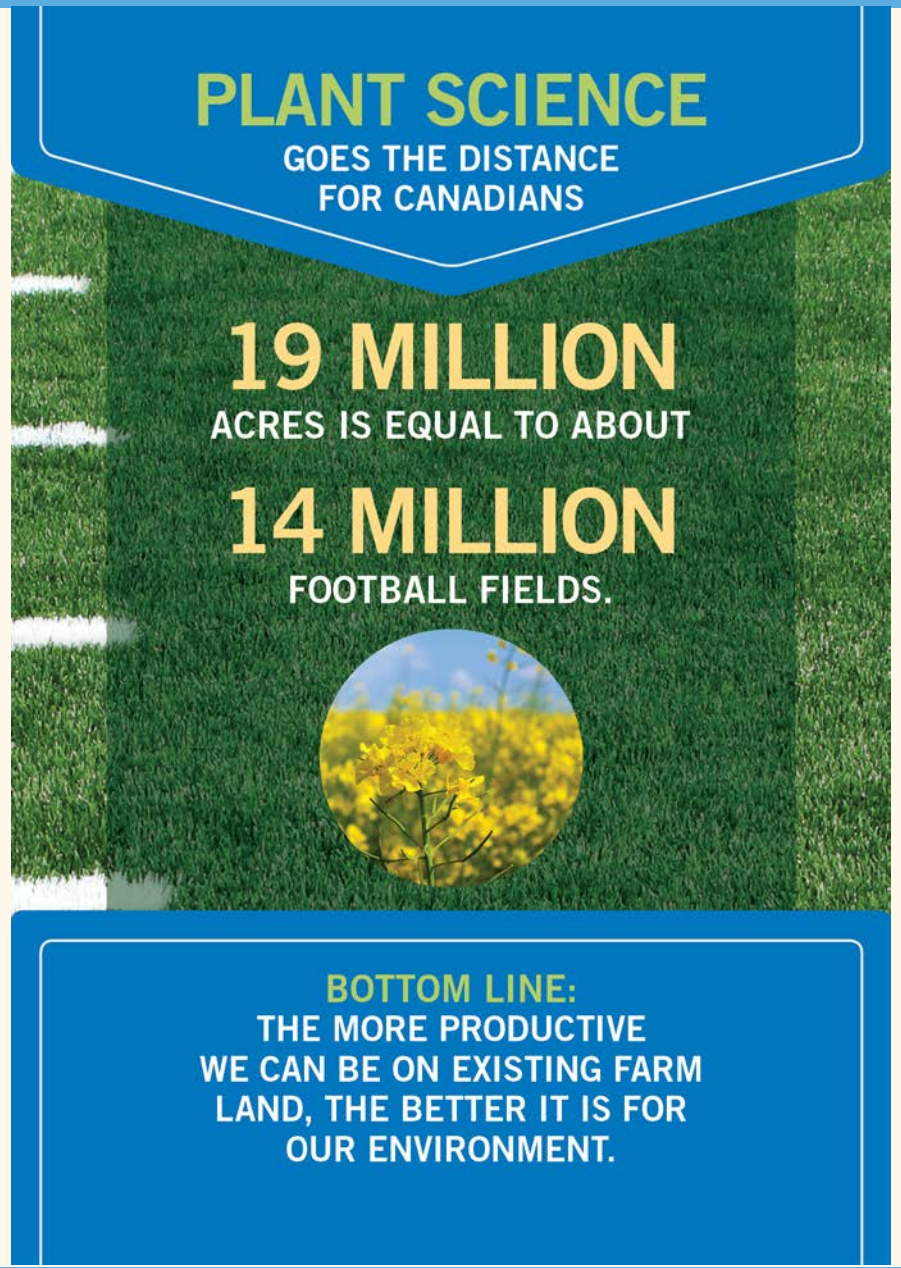
Tackling climate change

- Plant science innovations help farmers be more efficient, use fewer resources and have access to new crops that can thrive in changing climate conditions



Science = Sustainability

- The more we can grow be on existing farm land, the better it is for the environment
- Without plant science canola farmers would need 19 million more acres — or almost twice as much land — to grow the same amount they do today
- Without herbicides, wheat farmers would need 6.4 million more acres — 25% more land — to grow what they do today



Technology Developers Predictions

Based on pipeline data gathered from public and private technology developers

2008 Status	Predictions for 2015
GM events were developed by private sector in the U.S. and EU	50% of GM events were predicted to be developed by public sector outside of the U.S. and EU
GM benefits were predominantly agronomic	Greater number of crops and traits, significantly in crop composition and abiotic stress tolerance
Developers sought approval in multiple exporting and importing markets	Significant number of isolated foreign approvals

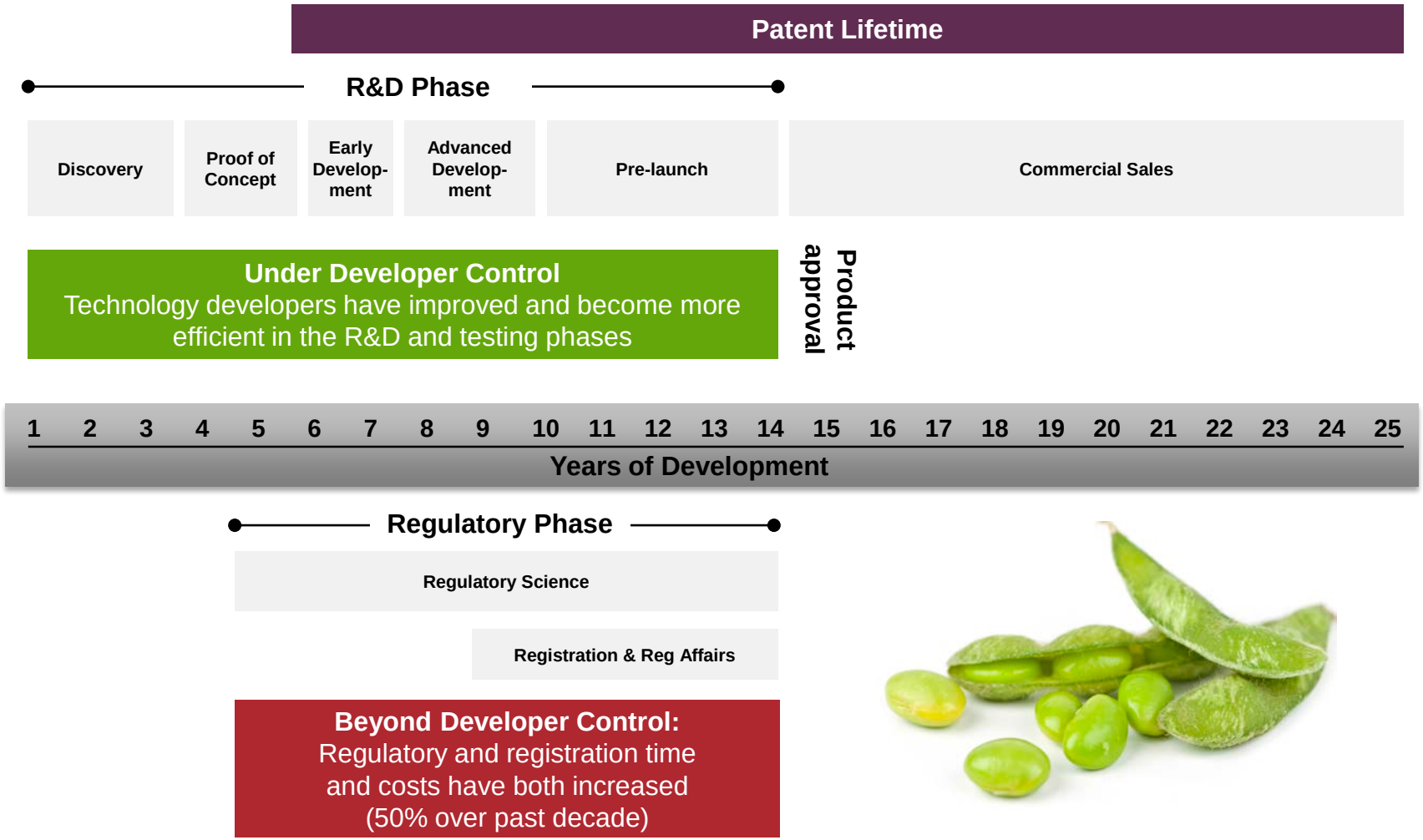
Institute for Prospective Technology Studies, Joint Research Commission, European Commission http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=2420

Predictions vs. Reality in 2014

Number of Commercial GM Events			
Crop	**2008 Status**	**Prediction for 2015**	**2014 Reality**
Soybean	1	17	5
Maize	9	24	15
Rapeseed	4	10	3
Cotton	12	27	16
Rice	0	15	1
Potatoes	0	8	0
Other	7	23	9
Total	**33**	**124**	**49**

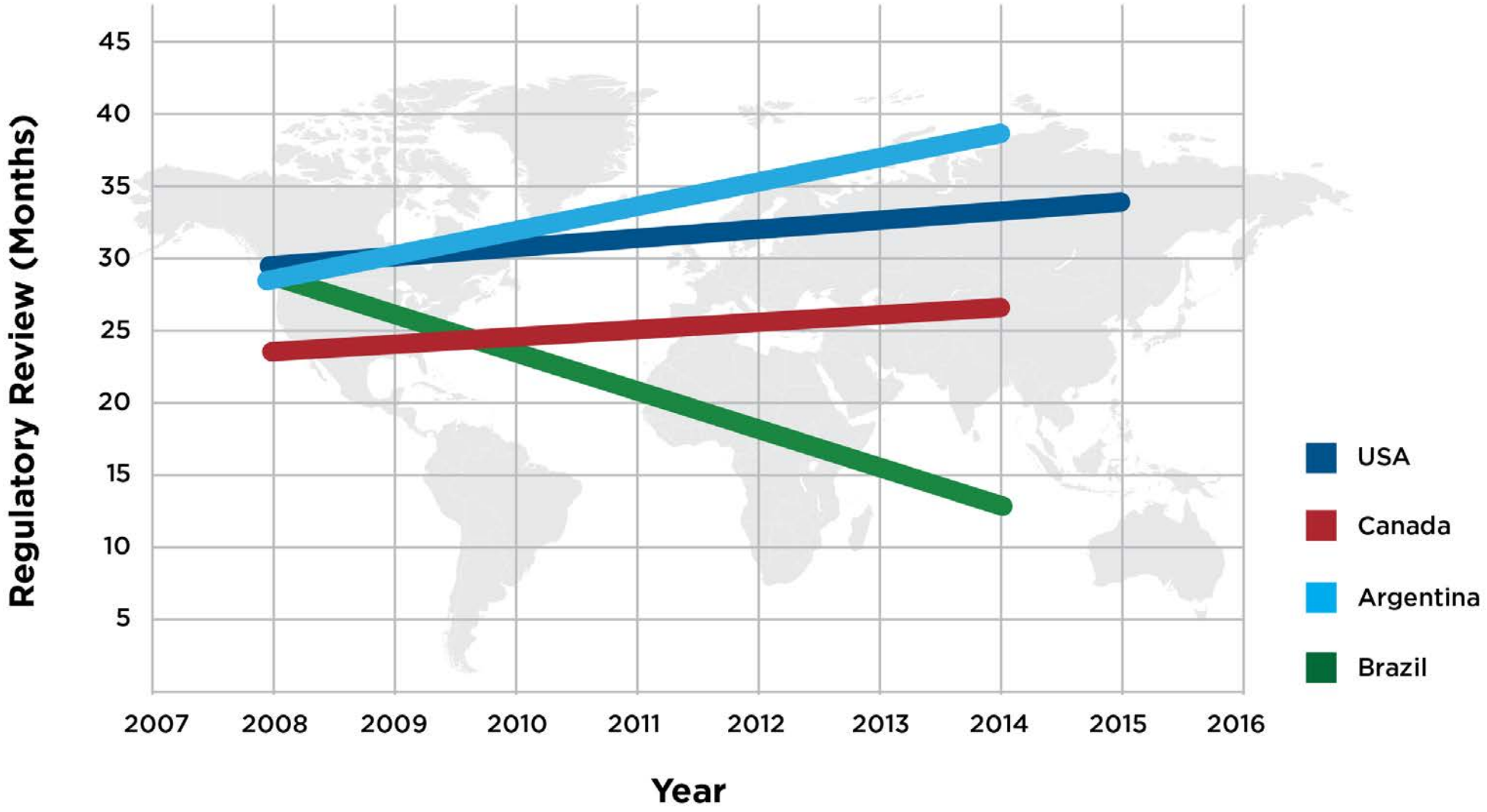
*Commercial = approved **and** marketed in at least one country*

Where's the Development Holdup?

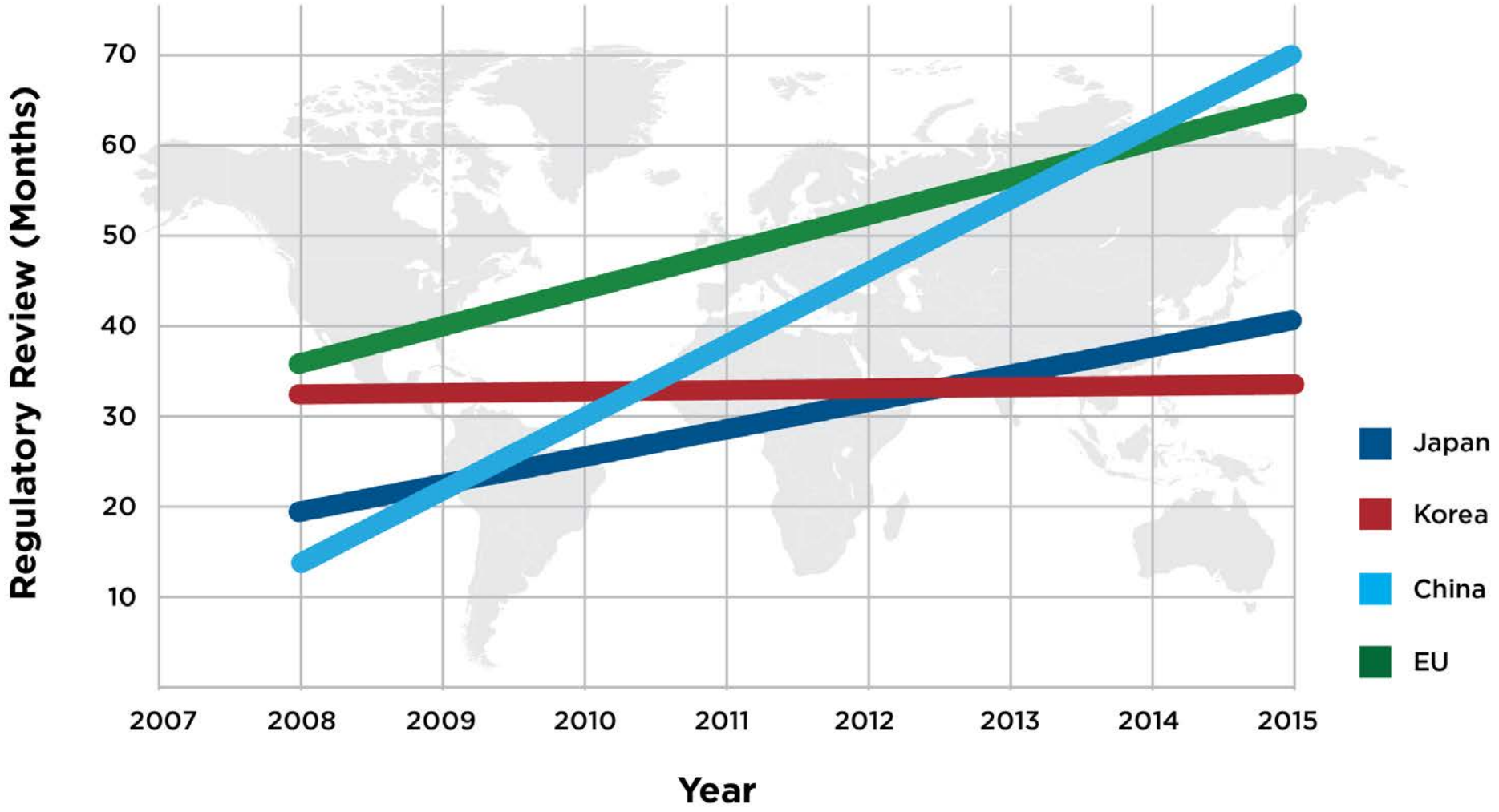


Source: Phillips McDougall 2012 / CLI Members

Cultivation Market Approval Timelines



Import Market Approval Timelines



Regulatory Systems are Blocking Innovation Delivery

Technology developers are **developing and delivering innovation**

Regulatory systems globally are **blocking delivery of innovation** to growers and consumers

So Much Potential in the Pipeline... PUBLIC & PRIVATE

CropLife INTERNATIONAL

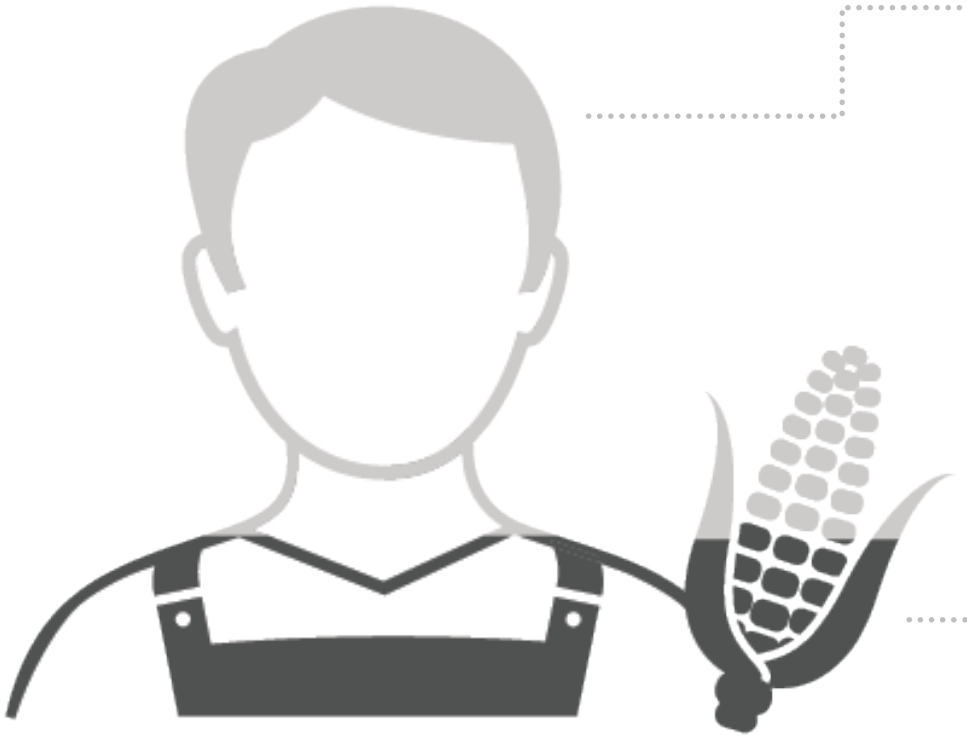
New biotech technologies to benefit growers

- Triple-stack rice
- Arctic Apples (non-browning)
- Innate Potatoes (protection against bruising)
- Herbicide & disease-tolerant soybeans
- Insect-resistant cotton
- Drought-tolerant maize
- Salt-tolerant & nutrient-enhanced wheat
- Aphid-resistant wheat
- Late blight resistant potato
- Disease-resistant banana

New biotech technologies to benefit consumers

- Healthy edible oils (no trans fat, low saturated fat)
- Golden Rice (beta-carotene), Iron-Rich Rice
- Pink Pineapple (higher lycopene)
- Biofortified sorghum (higher vitamin A, iron & zinc)
- Transgenic corn line (vitamin biofortified endosperm)

Opportunities Lost?

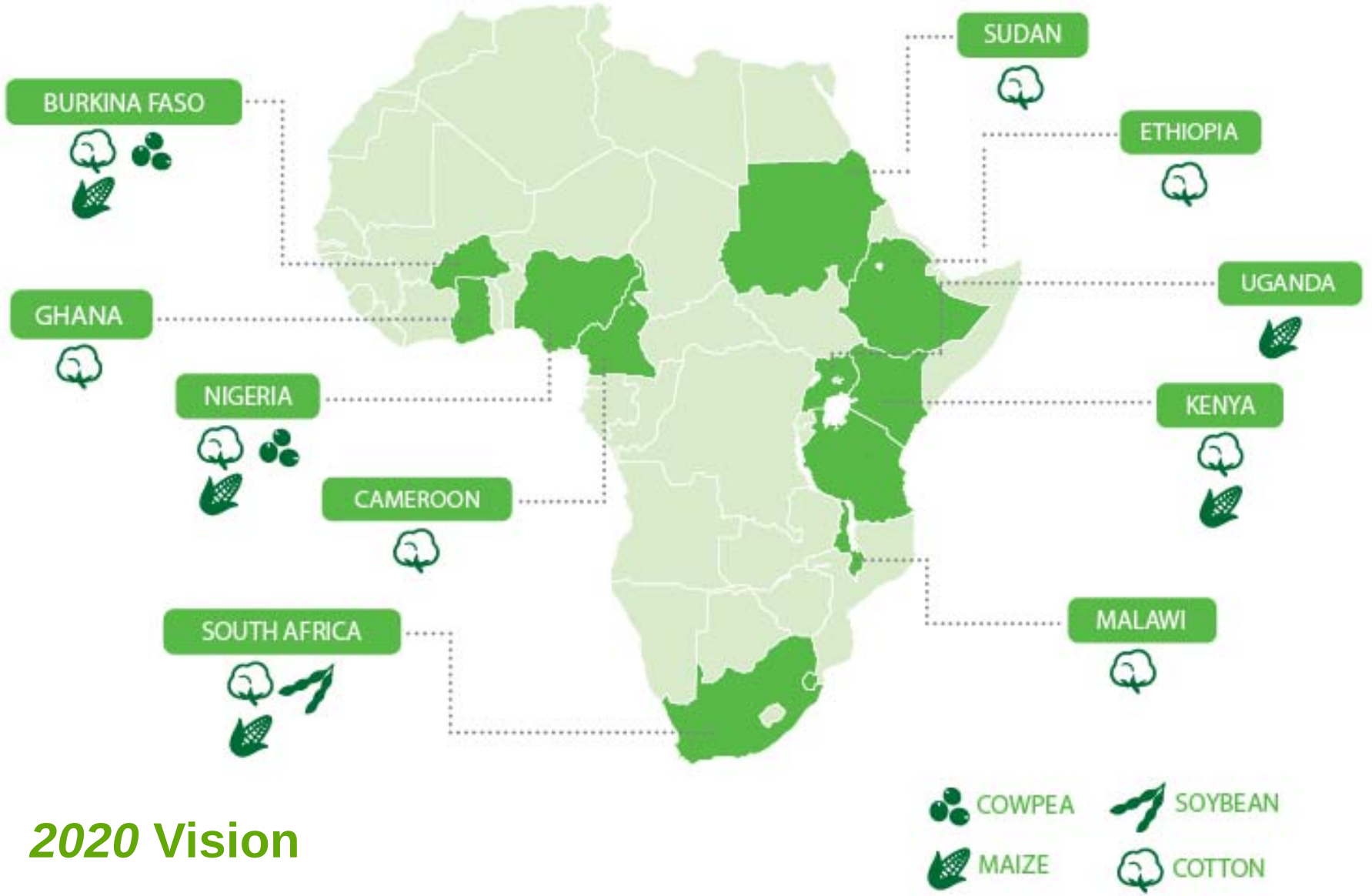


An updated forecast shows 2020 to be **less than 80%** of the 2008 prediction

At best, **less than 20%** of the products on the previous slide will actually make it to farmers by 2020

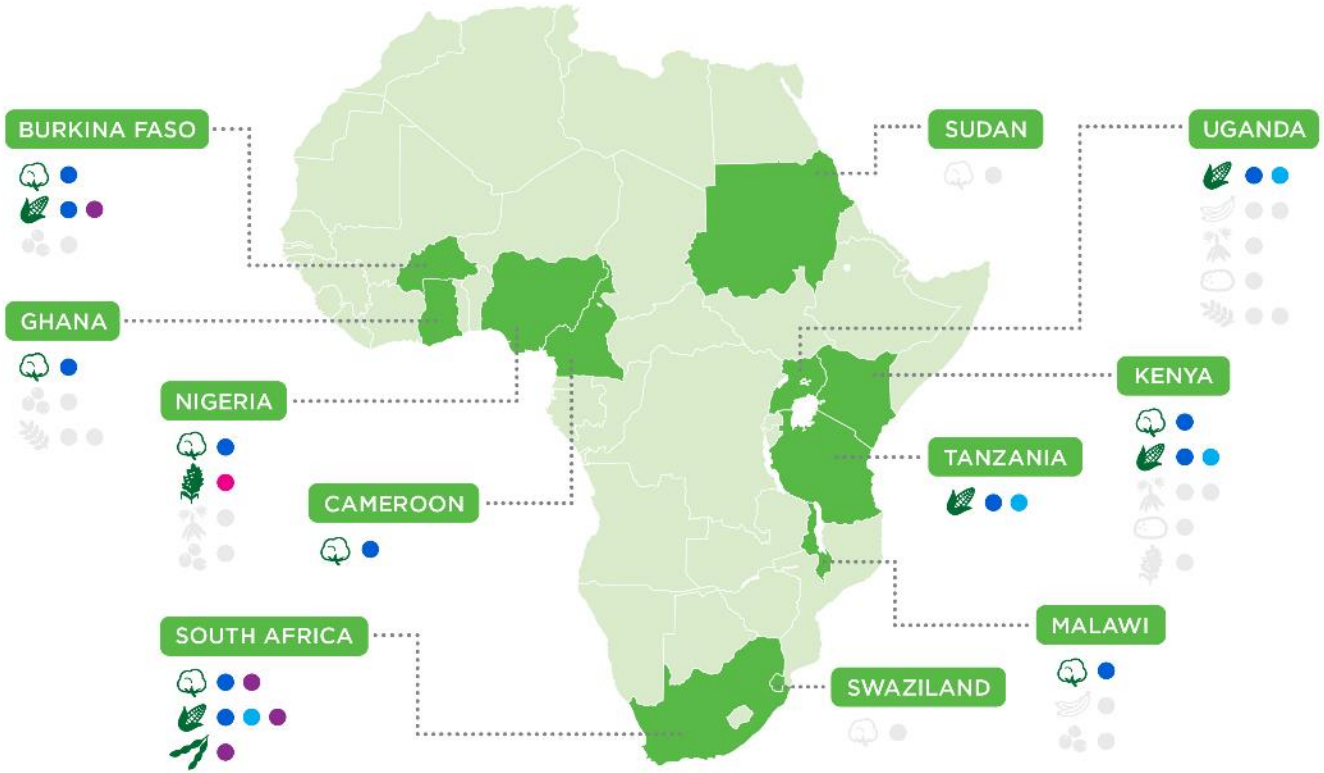
The global pipeline of GM crops out to 2020. *Nature Biotechnology* 34, 31-36 (2016), doi:10.1038/nbt.3449 Published online 08 January 2016

Biotech Utilization in Africa



2020 Vision

Biotech Pipeline in Africa



What do we need to do together?

Engage with policymakers to establish efficient, predictable and consistent science-based regulatory frameworks

Leverage the impressive safety record for plant science innovations

Look for opportunities to work with stakeholder partners to raise awareness of barriers to commercialization