



Matching expectations - plant breeding, farming and society

Garlich v. Essen ; EC-EPSO Conference ; Milan EXPO ; 14.7.2015



THE EUROPEAN SEED SECTOR

Diverse

> 7.000 companies
> 90% micro
enterprises & SMEs



Competitive

leading innovator
leading exporter



Innovative

+ 3.500 new
products/year
> 40.000 products
> 15% R&D of
annual turnover



Contributive

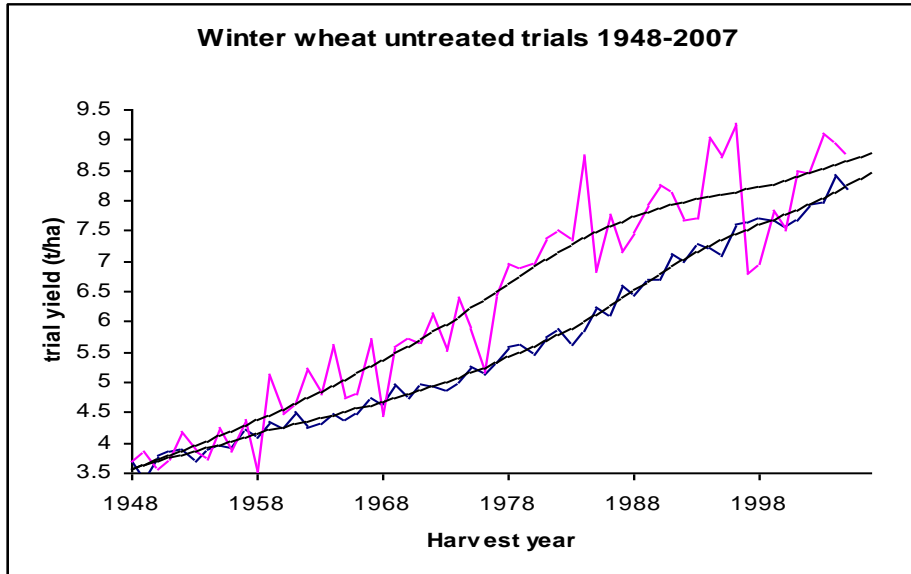
Bioeconomy ;
Food, feed, fibre,
fuel, fun ;
Growth & jobs in
rural areas



FACTS

- 🌱 10 billion people in 2050
- 🌱 growing demands for quantity and quality of food produced sustainably
- 🌱 Limited natural resources and increasing restrictions on many inputs
- 🌱 > 80% of productivity gains today are due to improved varieties and quality seed





- 1948-1981:
60% of gain due to improved varieties
- 1948-2007:
88% of gain due to improved varieties
- Since 1982:
almost all gain has been due to varieties

 **Genes and brains drive growth**



A NEED FOR SPEED

- Working with nature has long biological timescales
- Historical progress is insufficient for the future
- Plant breeding is a foundation of modern agriculture and societies
- Productive agriculture is well aligned with sustainability objectives

 **We need to do more and better – and faster!**



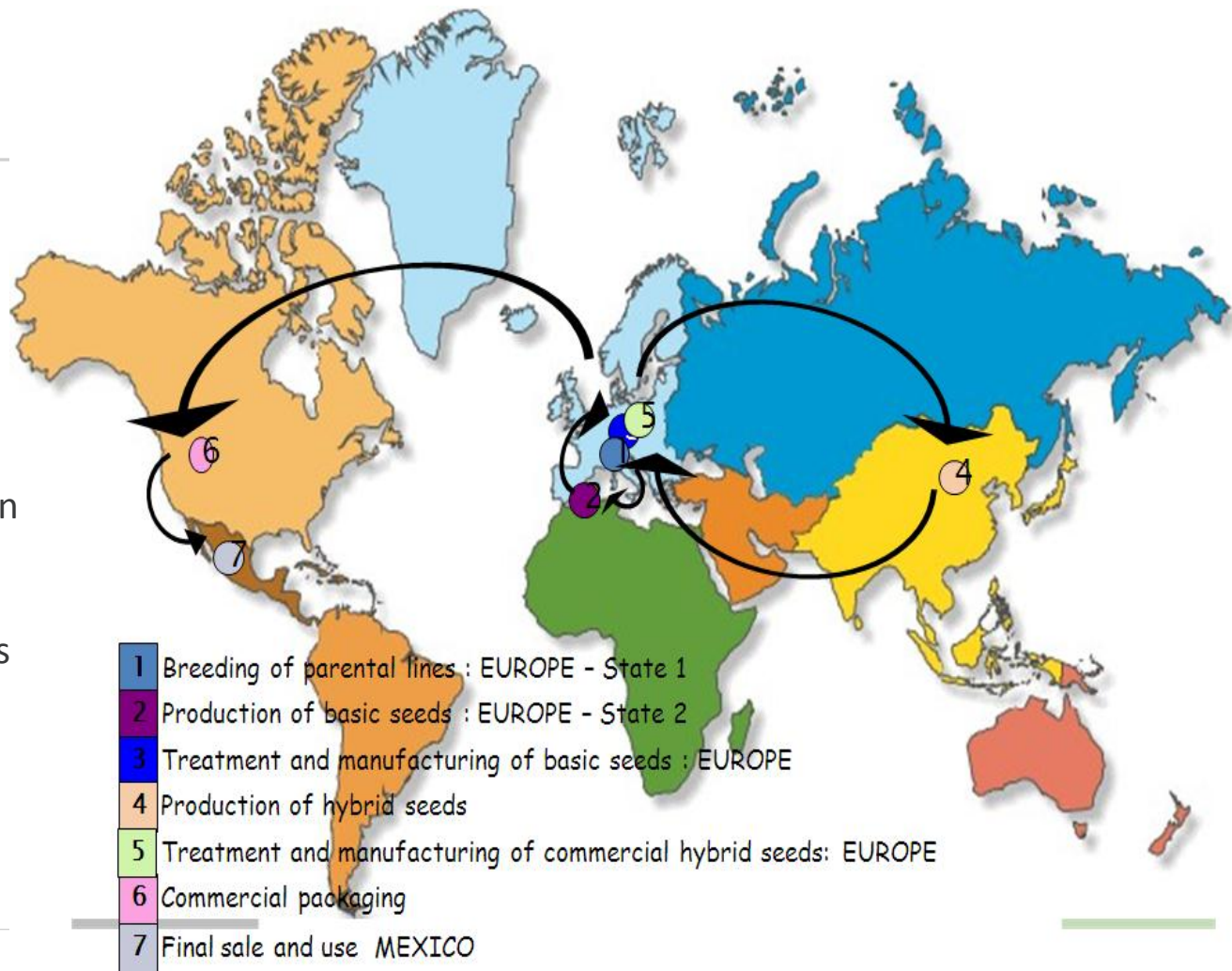
SPEEDING UP

International cooperation in R&D and movement of seed speed up breeding innovation and drive growth worldwide

25% of all commercial seed is traded internationally

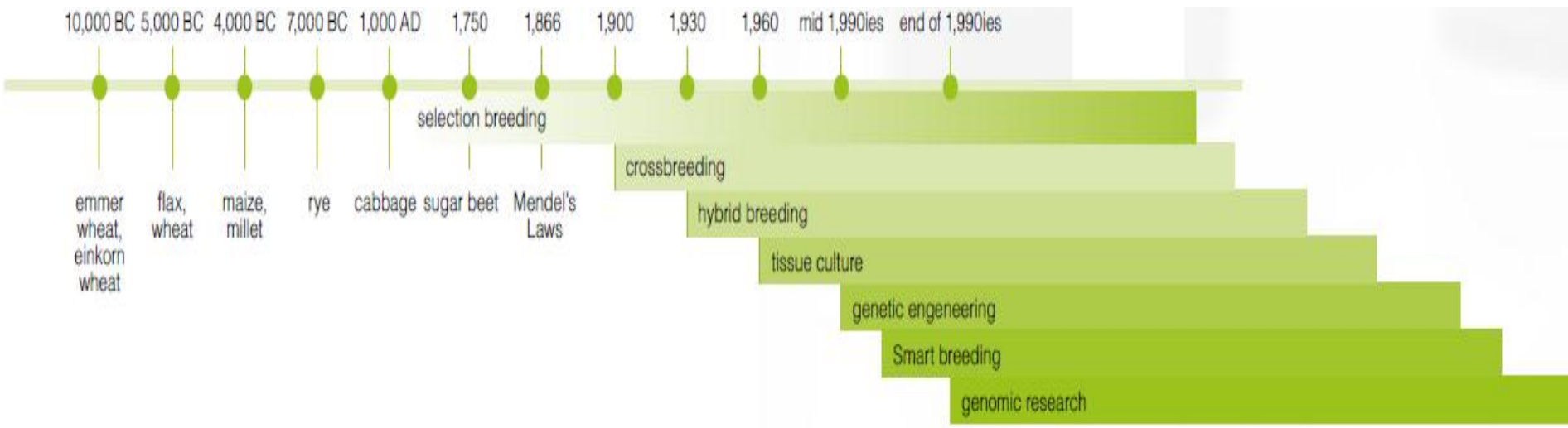
EU a leader in R&I

EU a leader in seed exports





SMARTENING UP





THE NEXT FRONTIER: GETTING EVEN SMARTER

RNA-dependent DNA methylation

PLANT agro-inoculation

REVERSE BREEDING **ZINC FINGER NUCLEASE**

BREEDING *double stranded*

ODM cisgenesis

AGRO-INFILTRATION

site-directed mutagenesis

SILENCING

INTRAGENESIS

oligonucleotide

GENE TARGETING



JRC REPORT ON NPBTs, 2011

- **Each of NBTs used** by two to four of the surveyed plant breeding companies,
- All NBTs have been **adopted in commercial breeding**
- ODM, cisgenesis/intragenesis and agro-infiltration are most used
- Most advanced crops close (2-3 years) to commercialisation (if classified as non GM)
- Main traits and species
 - herbicide tolerance and insect resistance in rapeseed and maize
 - fungal resistance in potatoes
 - drought resistance in maize
 - scab-resistant apples
 - potatoes with reduced amylose content

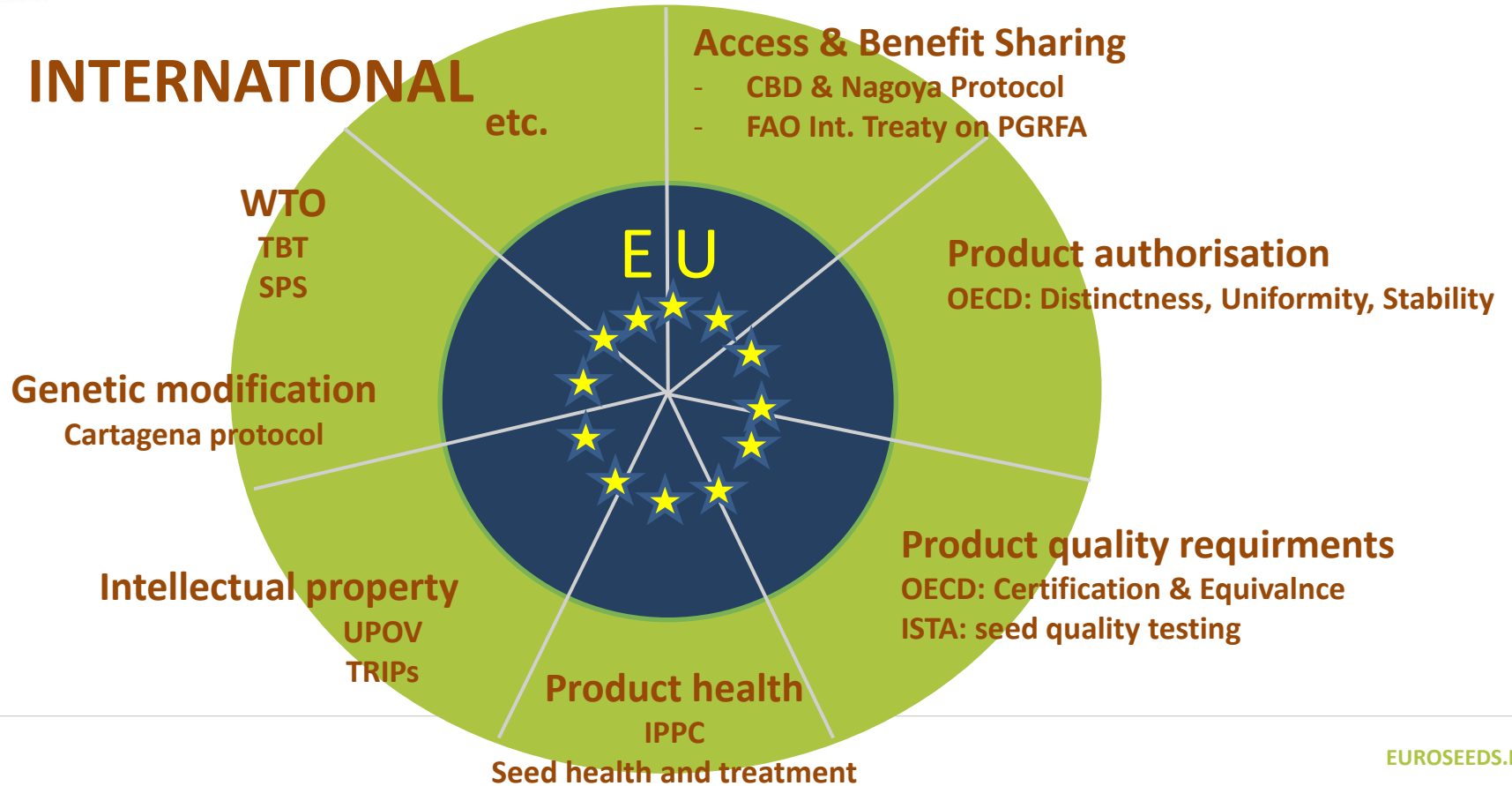


JRC REPORT ON NPBTs, 2011

- NPBTs make plant breeding **faster and more precise**
- NPBTs are of **high commercial interest**
- Plants resulting from NPBTs are in most cases **genetically indistinguishable** from traditionally bred plants
- New or specific legislative requirements for NPBTs may **distort the level playing field** by discriminating some technologies versus others
- Over-regulation of NPBTs may lead to
 - barriers to trade
 - limitation of consumer choice
 - lack of enforceability and potential fraud
 - brain and technology drain
 - competitive and technological disadvantage for European breeders and farmers
 - restricted access to genetic diversity for plant breeding



WHAT WE NEED : SUPPORTIVE RULES FROM ACCESS TO MARKET





GENETIC RESOURCES – LIFEBLOOD OF PLANT BREEDING INNOVATION

EU Nagoya Implementing Regulation

- Track and trace obligations excessive for companies, specifically SMEs
- Restricts free access for further research and breeding
- Incompatible with business realities

FAO IT and sMTA

- On-going discussion on improvements
- Must become compatible with business reality

Plant breeders need

- **Facilitated access in line with business models**
- **Recognition of societal value of conservation by utilisation through commercial plant breeding**

Access & Benefit Sharing

- CBD & Nagoya Protocol
- FAO Int. Treaty on PGRFA

EU Nagoya Implementing Regulation



GENETIC MODIFICATION & SEED

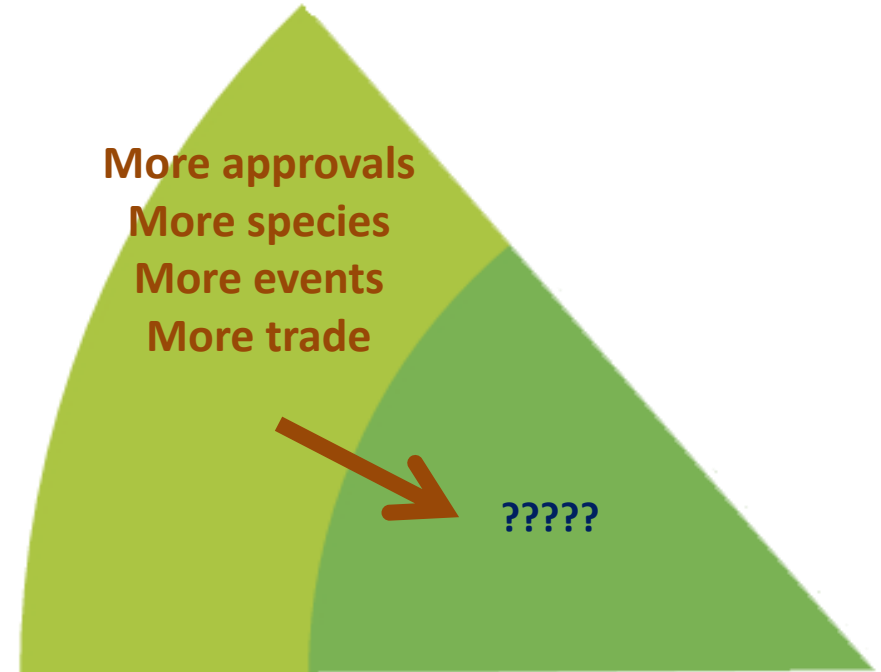
European policies fail to support and embrace the technology

Practical rules managing market realities still missing (e.g. presence of GMOs in seed)

Prohibitive scale of regulatory requirements (SMEs)

Plant breeders need

- internationally harmonised sampling and testing protocols and sustainable thresholds for presence of approved GM events in conventional seed
- facilitation of (re-)authorisations of (generic) events: application of the familiarity principle for well-known traits with established safety records to broaden use to more biodiversity (minor species)



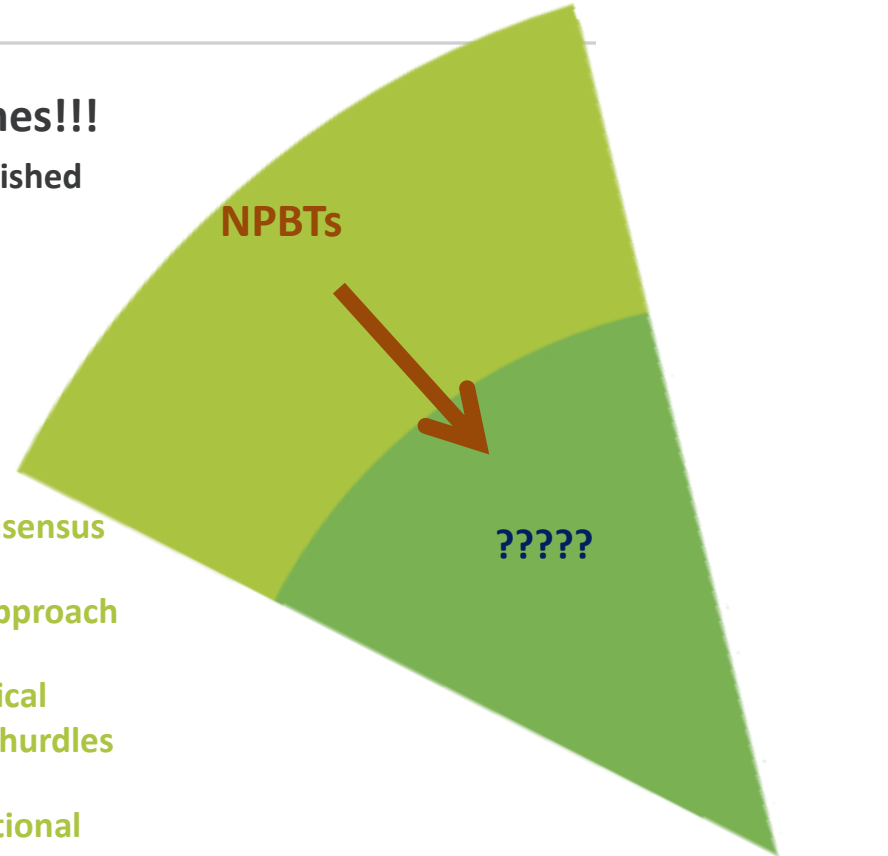
Europe again risks to loose brains and genes!!!

Discussion since 2008, reports since 2012, well established scientific consensus, yet... -

lack of leadership and action!

Plant breeders need

- legal certainty (Commission Interpretative Document / Guidance) and wider policy consensus
- enabling instead of prohibitive regulatory approach
- application of existing knowledge and practical experience (familiarity) to lower regulatory hurdles
- pro-active, supportive leadership in international discussions





NPBTs – AND BEYOND...

Europe must...



Enable development and use of new technical developments to address the societal grand challenges



- support an enabling regulatory environment from access to genetic resources over application of modern plant breeding technologies to appropriate IP tools
- integrate policy making on agricultural inputs including plant breeding
- assure forward-looking, enabling support linking research, innovation and enterprise
- and: Europe must ...



SPEAK UP
FOR SEEDS!





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