



# ESA

## European Seed Association

### Potential obstacles for future plant breeding

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*Disclaimer: The presentation contains the personal views of the author and does not necessarily reflect the position of ESA.*



Before I start:

## **SOME WORDS ABOUT ESA**



## About ESA:

ESA is the voice of the European seed industry, representing the interests of those active in research, breeding, production and marketing of seeds of agricultural, horticultural and ornamental plant species.

## ESA's mission is to work for:

- effective protection of intellectual property rights relating to plants and seeds;
- fair and proportionate regulation of the European seed industry;
- freedom of choice for customers (farmers, growers, industry, consumers) in supplying seeds as a result of innovative, diverse technologies and production methods;



## ESA members:

- Association members:
  - 35 National Seed Associations
- Individual Members:
  - 43 Seed Companies – direct members
- Associate Members:
  - 18 Companies

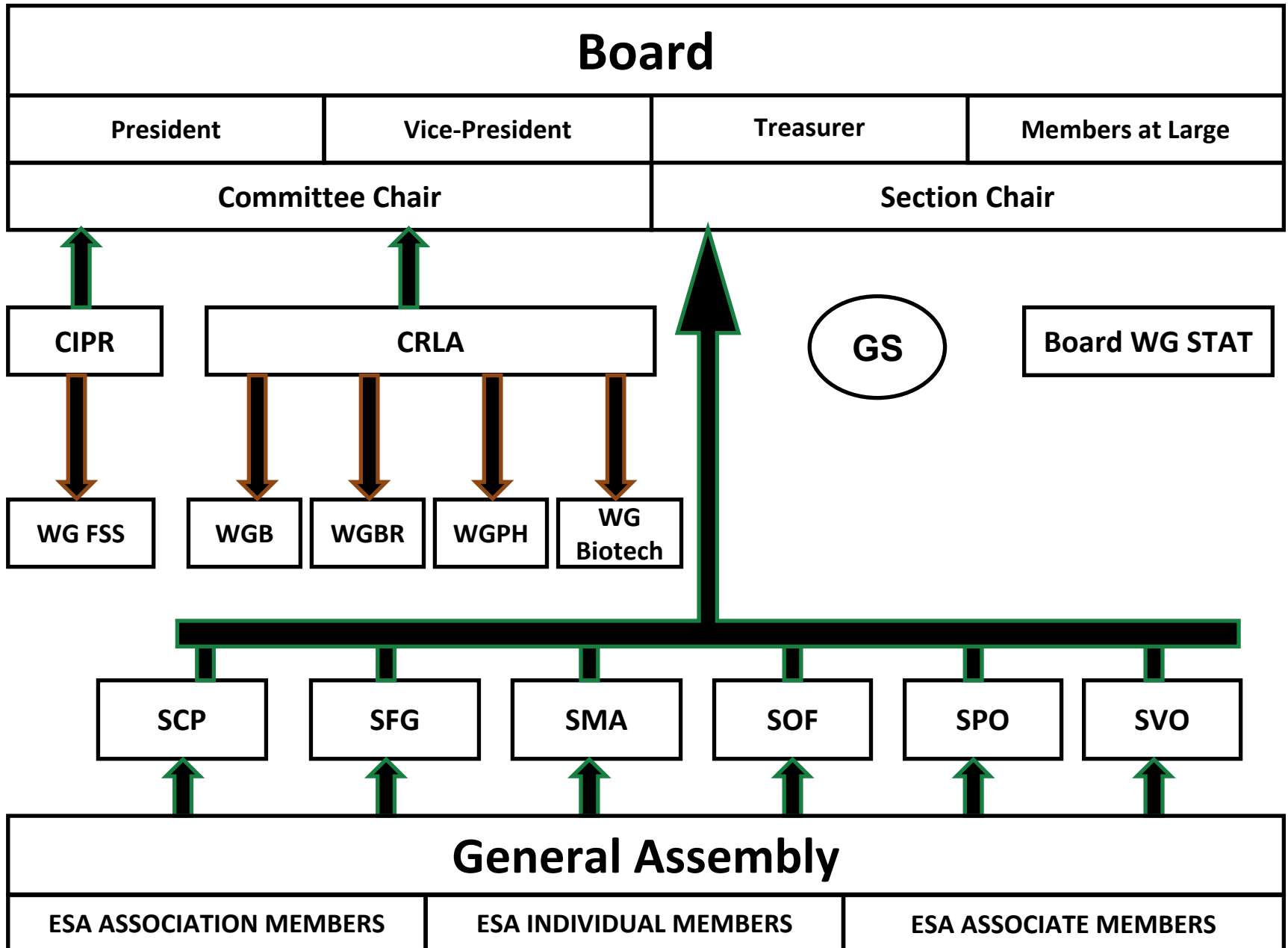




# ESA Members today



# ESA Structure



# Summary

1. Are there any obstacles for plant breeding?
2. What are the obstacles?
3. How to overcome the obstacles?



# ARE THERE ANY OBSTACLES FOR PLANT BREEDING?



# Are there any obstacles?

obstacle = plant breeding cannot function in a way to meet its aim

aim = creation of plant varieties capable to meet new needs and challenges → innovation



obstacles = elements that impede or slow down the continuous innovation



**Yes, there are obstacles to plant breeding.**



## WHAT ARE THE OBSTACLES?



# Innovation

Innovation is key for plant breeding

How is this innovation stimulated?

By two major means:

- via a well designed regulatory framework: seed marketing legislation
- via a balanced and effective IP protection



# Innovation – S&PM

## The Seed Marketing Legislation:

- has created a level playing field for European breeders
- has created a common market for seed
- has provided farmers and growers with ever better quality and choice
- has made more biodiversity available than ever before



Stimulates innovation in its current form → no obstacle

N.B.: under review



# Innovation - IP

## IP protection:

IP = exclusive right (monopoly) granted by the State to an inventor

IP → allows a fair return on investment



IP stimulates innovation



# Innovation - PVP

## IP protection in plant breeding:

Plant variety protection – UPOV Convention

Specific: tailored to the needs of the plant breeding sector

Exclusive right but “open source” → breeding exemption

Allows a return on investment but proper enforcement necessary



# Innovation - PVP

## Enforcement of PVP

→ Weak point:

- enforcement possibilities not satisfactory
- farm saved seed



Can become an obstacle to plant breeding and breeding progress



# Innovation - PVP

## What is the problem?

Self-reproducing material → easy to infringe,  
difficult to police and prove

Enforcement provisions not tailored to the specific  
material and IP



# Innovation - PVP

**FSS:** current legislation makes enforcement and royalty collection burdensome and ineffective



"Clue"??



# Innovation - PVP

## How to overcome this obstacle?

Improve the legislation

EU PVP Regulation – currently under revision



Room and possibility for improvements



# Innovation - patents

IP for plant-related inventions:

Patent protection – “new”, unusual tool for the sector  
For: innovative breeding techniques; GM traits; but also for breeding methods; native traits

Real monopoly situation – no breeding exemption =  
no possibility to freely use the genetic material for  
further breeding



# Innovation - patents

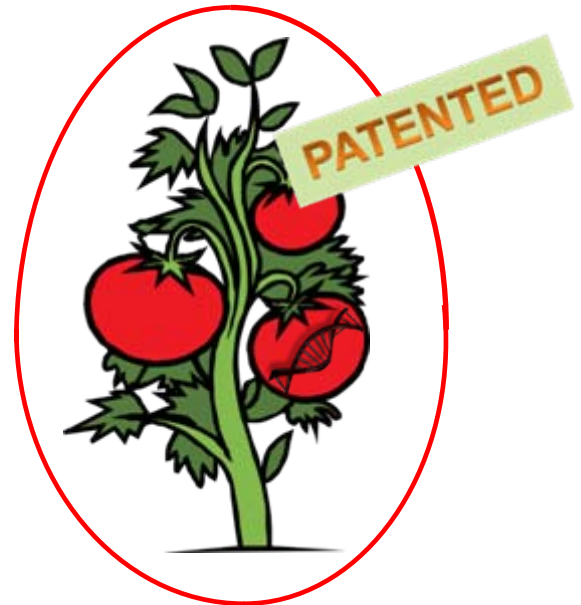
Difference between the two systems:

PVP



a plant variety =  
a specific combination  
of genetics

Patents



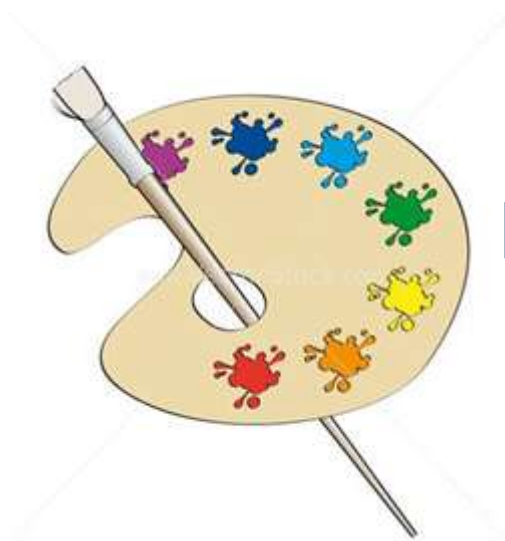
a generic building block =  
a gene / trait



# Innovation - patents

Innovation in plant breeding – dependent on the availability of genetics

Patents – may protect the building blocks - touch upon the basics of breeding



# Innovation - patents

## Potential consequences:

If building blocks are patented

- pool of freely available genetics reduced
- less basis for innovation

Available if one can afford

- few can afford
- reduction of the diversity of the sector
- reduction of choice



# Innovation - patents

This is NOT to say that:

- patents are not good for innovation
- plant breeding sector does not need patents

To the contrary:

- Patents are necessary to protect important inventions
- PVP can only provide protection for plant varieties as such – not for other subject matter

BUT tendency: more and more things get patented that should not – do not merit patent protection

→ a solution is needed



# Innovation - patents

**WHAT IS THE SOLUTION?**



**I don't know.**



# Innovation - patents

Within ESA – IP committee

→ discussing the topic

→ trying to find the best way to cope with the problem

Both regarding:

- Kinds of patents granted
- Access to patented genetic material for breeding



# Some recent developments

## Broccoli decision (G2/07)



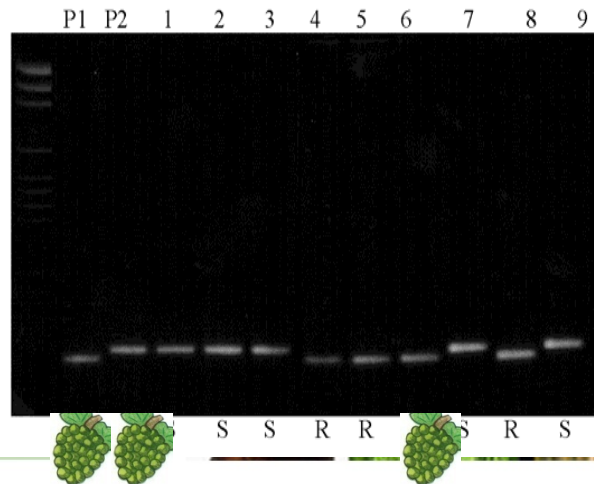
X



= biological crossing

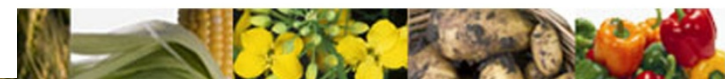
→ not patentable

+



= technical step  
involved

→ not patentable



# Way forward

Broccoli provides a small clarification

Need for further clarification on patentable subject matter

→ how?

Balanced solution to ensure the smooth continuation of traditional breeding work but keep incentive and reward for “real” plant-related inventions



**THANK YOU FOR YOUR ATTENTION!**

Szonja Csörgő

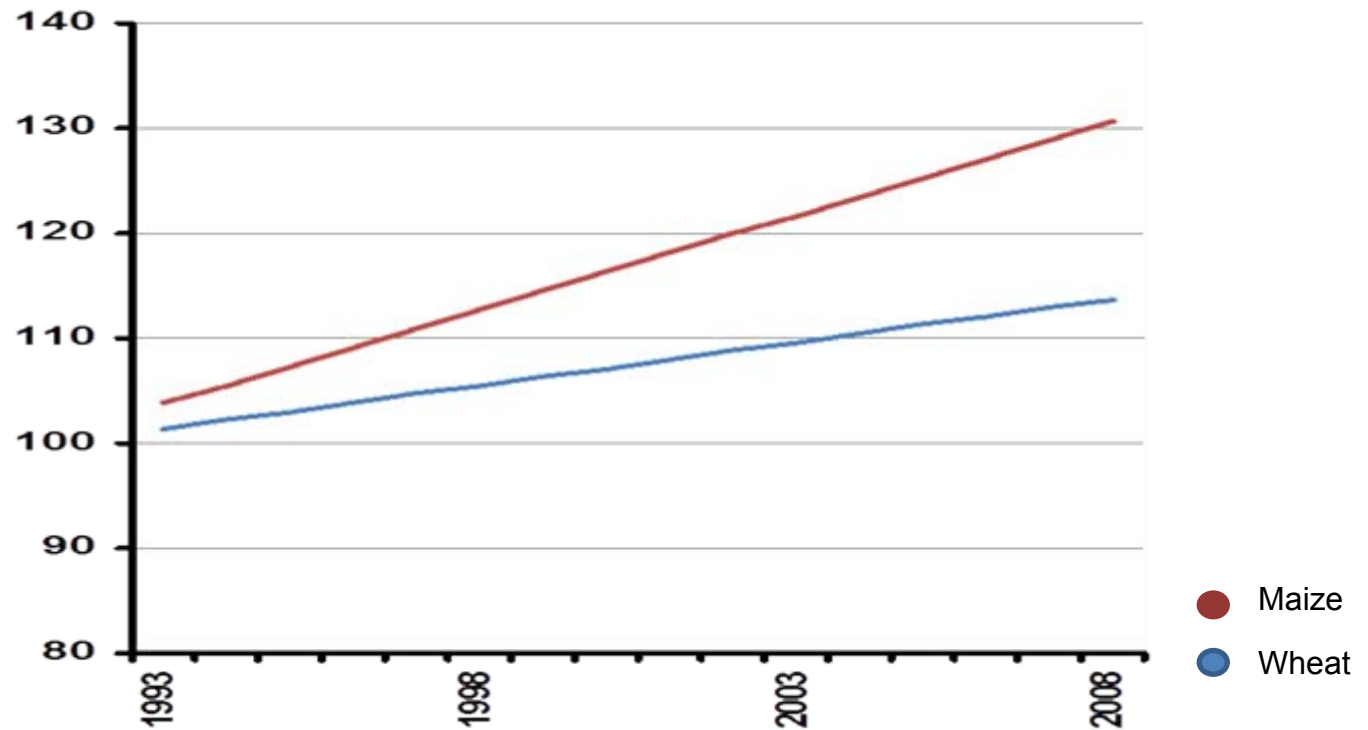
[szonjacsgo@euroseeds.org](mailto:szonjacsgo@euroseeds.org)



# Back-ups



## Yield development in maize and wheat in EU 27



Source: FAOSTAT



# Patent data

According to data of the EPO (2009):

1300 European patents have been granted for inventions relating to plants

of which:

- 1221 for inventions involving genetic modification of a plant
- 79 for inventions which do not involve genetic modification

Source: EPO



# Broccoli decision

1. A method for the production of *Brassica oleracea* with elevated levels of 4-methylsulfinylbutyl glucosinolates, or 3-methylsulfinylpropyl glucosinolates, or both, which comprises:
  - a) crossing wild *Brassica oleracea* species selected from the group consisting of *Brassica villosa* and *Brassica drepanensis* with broccoli double haploid breeding lines;
  - b) selecting hybrids with levels of 4-methylsulfinylbutyl glucosinolates, or 3-methylsulfinylpropyl glucosinolates, or both, elevated above that initially found in broccoli double haploid breeding lines;
  - c) backcrossing and selecting plants with the genetic combination encoding expression of elevated levels of 4-methylsulfinylbutyl glucosinolates, or 3-methylsulfinylpropyl glucosinolates, or both; and
  - d) selecting a broccoli line with elevated levels of 4-methylsulfinylbutyl glucosinolates, or 3-methylsulfinylpropyl glucosinolates, or both, capable of causing a strong induction of phase II enzymes, wherein molecular markers are used in steps (b) and (c) to select plants with genetic combination encoding expression of elevated levels of 4-methylsulfinylbutyl glucosinolates, or 3-methylsulfinylpropyl glucosinolates, or both, capable of causing a strong induction of phase II enzymes.”
2. A method according to claim 1, wherein the *Brassica oleracea* breeding lines are broccoli double haploid breeding lines containing at least one self-incompatibility (SI) allele the presence of which results in self-incompatibility in the *Brassica oleracea* breeding lines, comprising crossing wild *Brassica oleracea* with broccoli double haploid breeding lines containing the specific SI alleles to produce plants; and selecting for said plants by screening for said specific SI alleles with molecular probes.
3. The method according to claim 1 or claim 2, wherein only 4-methylsulfinylbutyl glucosinolate is elevated relative to that initially found in the *Brassica oleracea* breeding lines.
4. The method according to claim 1 or claim 2, wherein only 3-methylsulfinylpropyl glucosinolate is elevated relative to that initially found in the *Brassica oleracea* breeding lines.

**NOT PATENTABLE**



# Broccoli decision

5. An edible *Brassica* plant produced according to the method of any one of claims 1 to 4.
6. An edible portion of a broccoli plant produced according to the method of any one of claims 1 to 4.
7. Seed of a broccoli plant produced according to the method of any one of claims 1 to 4.
8. A broccoli plant having elevated levels of 3-methylsulfinylpropyl glucosinolates, or 4-methylsulfinylbutyl glucosinolates, or both, wherein the broccoli plant is a hybrid plant following crossing of broccoli double haploid breeding lines with wild *Brassica oleracea* species selected from the group consisting of *Brassica villosa* and *Brassica drepanensis* and the levels of 3-methylsulfinylpropyl glucosinolates, or 4-methylsulfinylbutyl glucosinolates, or both, are between 10 and 100 pmoles per gram of dry weight of said plant.
9. A broccoli inflorescence having elevated levels of 3-methylsulfinylpropyl glucosinolates, or 4-methylsulfinylbutyl glucosinolates, or both, wherein the broccoli inflorescence is obtained from a hybrid plant following crossing of broccoli double haploid breeding lines with wild *Brassica oleracea* species selected from the group consisting of *Brassica villosa* and *Brassica drepanensis* and the levels of 3-methylsulfinylpropyl glucosinolates, or 4-methylsulfinylbutyl glucosinolates, or both, are between 10 and 100 pmoles per gram of dry weight of the inflorescence.

