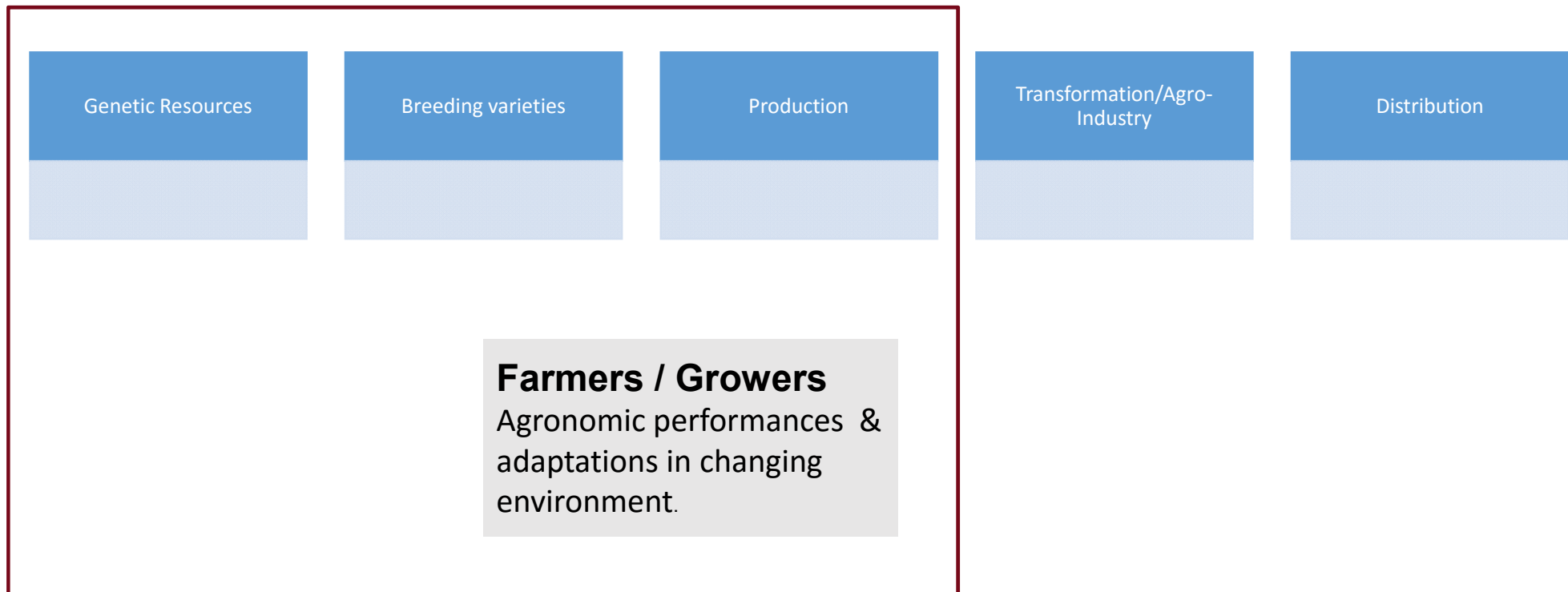


Workshop: Genetic resources for value chain development,
Brussels, 11 & 12 January 2016



**The private breeding sector
and the sustainable use and
conservation of PGR**

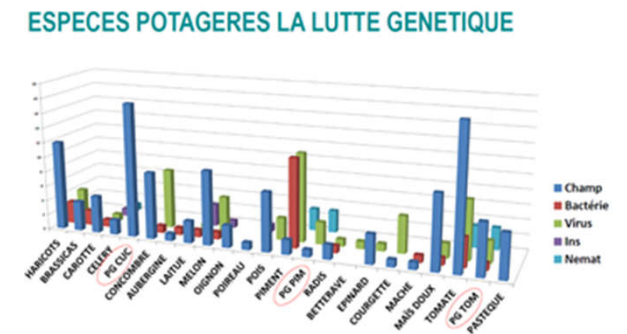
Innovation along the value chain: anticipate the users needs



Breeding goal= Expectations of users

Agronomic performances & adaptations in changing environment:

- Climate * soil * production systems: Plasticity for adaptation
 - Due to architecture, growth cycle, planting density, sowing date (for escaping strategies)
 - Specific characteristics and genes introduced (like drought, heat tolerance,)
- Pest tolerances: biotic stresses (pathogens, virus, bacteria, insects,)
 - ex. A given variety may contain a large number of resistance
- Improve Environmental performances
 - Natural resources, ...



Environ 50% des efforts de Recherche et Sélection sont consacrés à la Pathologie

Breeding goal= Expectations of users

Agronomic performances & adaptations in changing environment:

- Pest tolerances: biotic stresses (pathogens, virus, bacteria, insects,)

- Ex. Sunflower (downy mildew)

History in Europe :

70's : 2 genes (pl1, pl2)

90's : 3 genes (pl6, pl8, pl5)

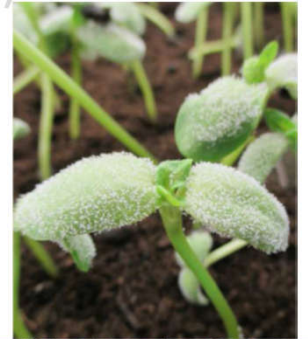
2000's : search for new genes :

USDA+ INRA+ private : screening with wilds species => at least 17 genes available
now from different 4-5 species

⇒Mildew is under control

⇒Increase of the variability in the crop

- Pest resistances improve environmental performances



Breeding processes



**GR Collect and
Maintenance**

**GR
characterization**

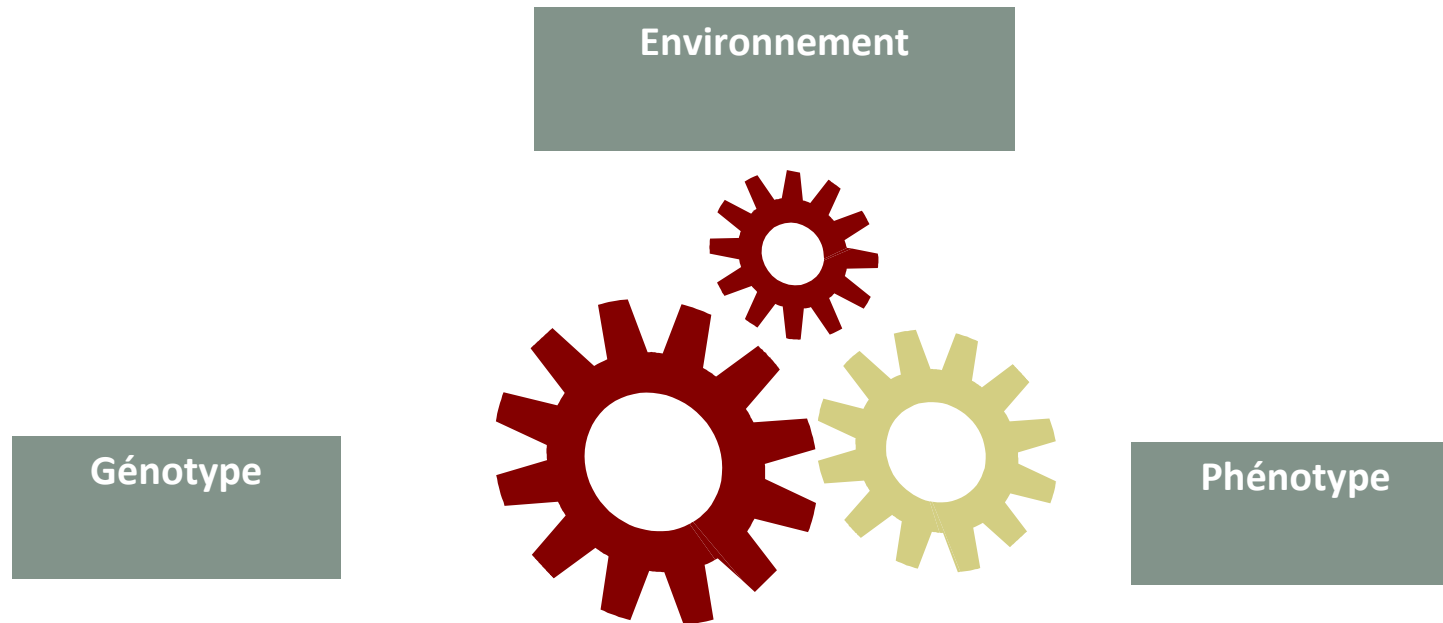


Pre-breeding



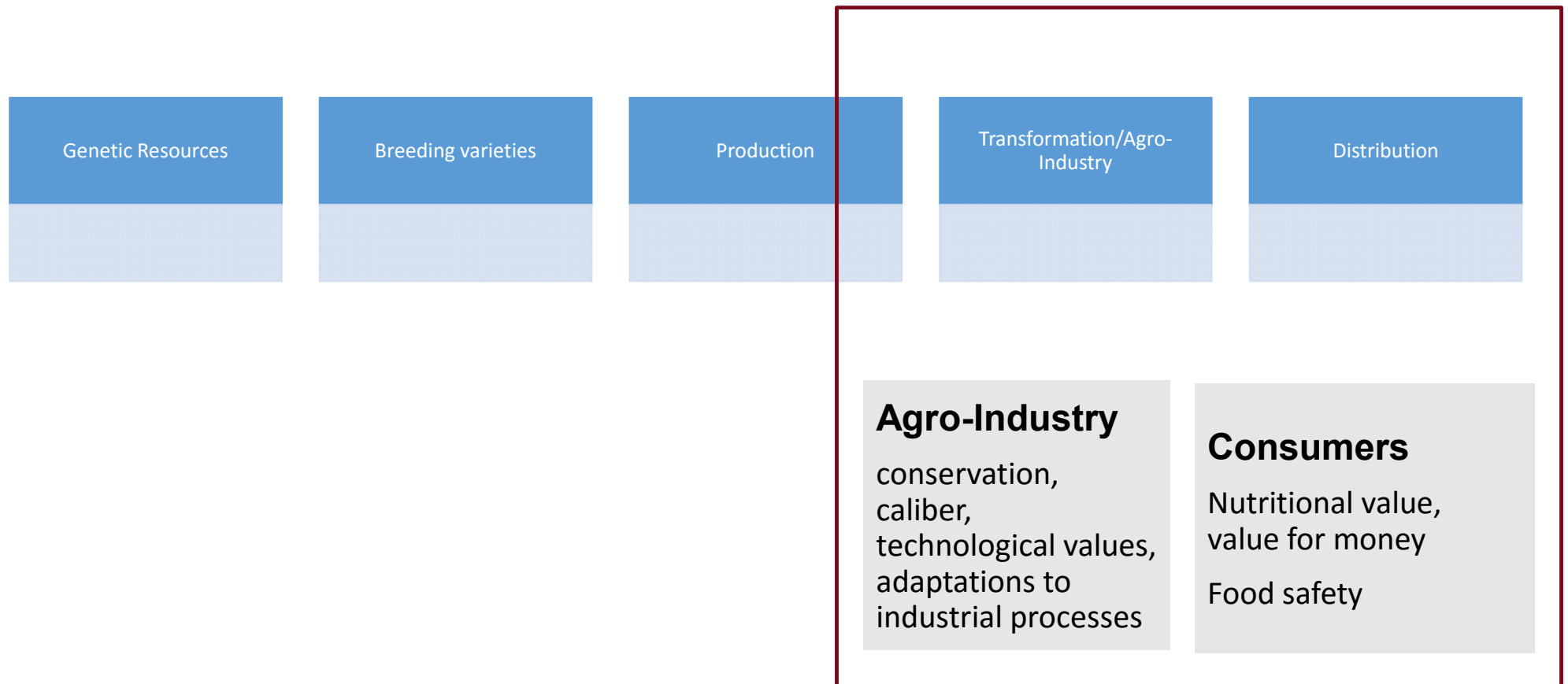
**Breeding for
commercial
varieties**

With numerous elements to associate together



- capacity to associate the most favorable version of a maximum of genes in a given plant, for many environments
- Focus on all traits at the same time for each variety

Innovation along the value chain: anticipate the users needs



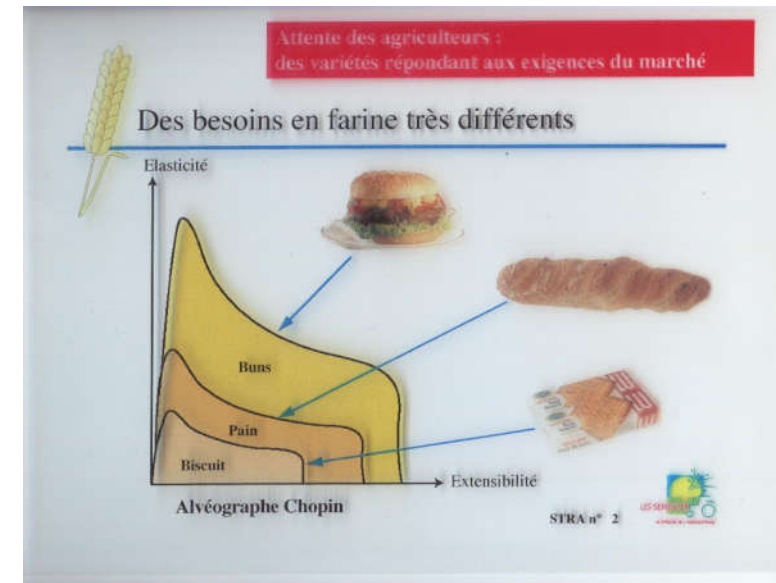
Breeding goal= Expectations of users

Agro-industry transformation

- conservation, calibration, adaptations to industrial processes
 - BEANS: adaptation to freezing , canning processes
- Nutritional and technological characteristics
 - Sunflower Oleic oil
 - Corn varieties adapted to corn flake, wheat variety for Biscuit

Consumers expectations:

- Organoleptic characteristics, health, aspect money for value, ..
 - Beans without stringiness
 - Cherry tomatoes



Breeding goal= Expectations of users

Agro-industry transformation

- conservation, calibration, adaptations to industrial processes
- ex.beans :
 - Industry process: grouped harvest for homogenous quality
 - vs breeding for Home Gardeners : spread harvest
 - With the package of agronomic performances
- Wild relatives are conserved: phaseolus coccineus, P. lunatis,



Breeding goal= Expectations of users

Consumers expectations:

- Organoleptic characteristics, health, aspect money for value, ..
 - beans without stringiness
 - cherry tomatoes:
 - Up to 15 wild relatives: most of them or not domesticated, not eatable,
 - *Solanum pimpinellifolium* crossed with the domesticated specie



Enrichment of the offer and GR: ex the French catalogue: 9000 varieties / 250 species

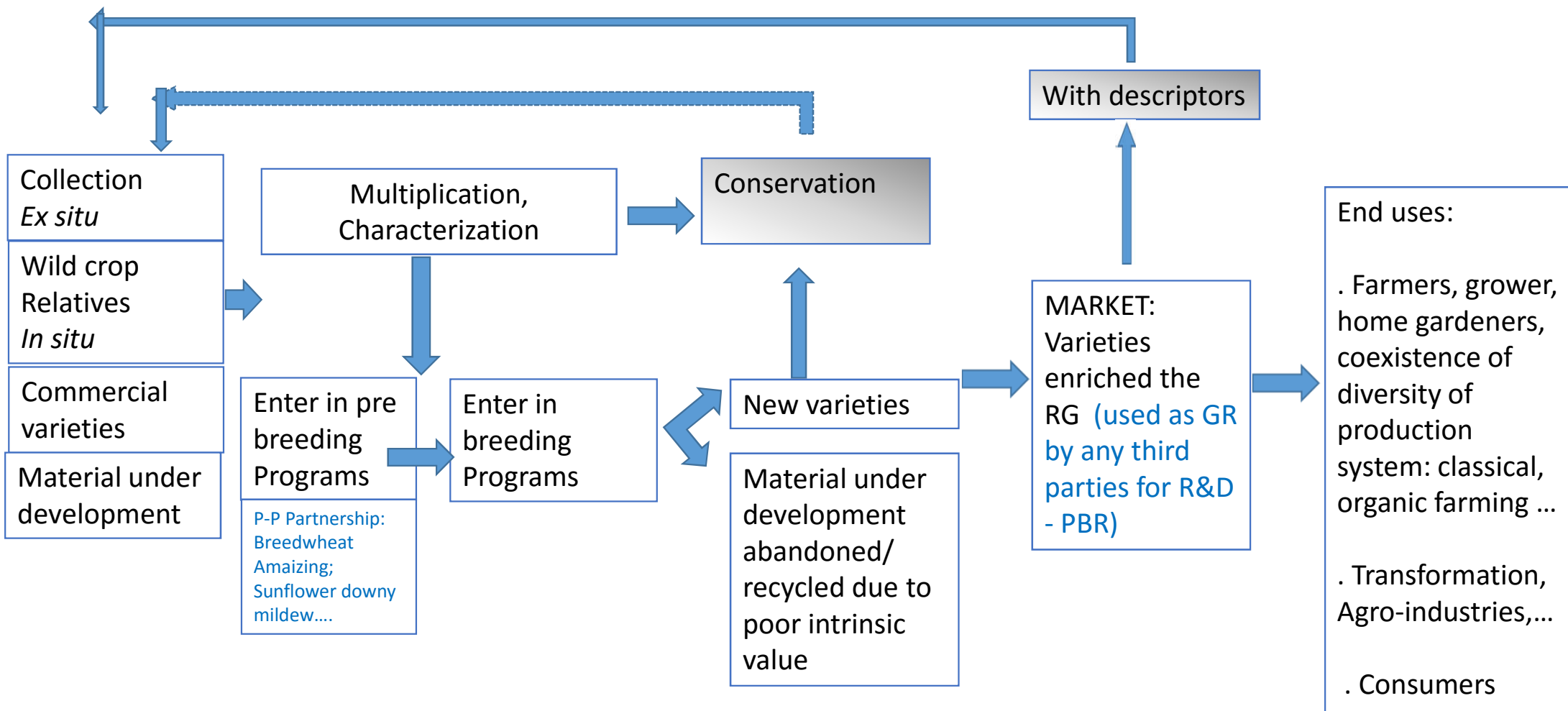
Field crop species: 4800

Vegetables species: 2600

Fruit species: 1350

Varieties for Amateurs, old varieties, local populations: 582

Contribution of the private BREEDING SECTOR to RG conservation



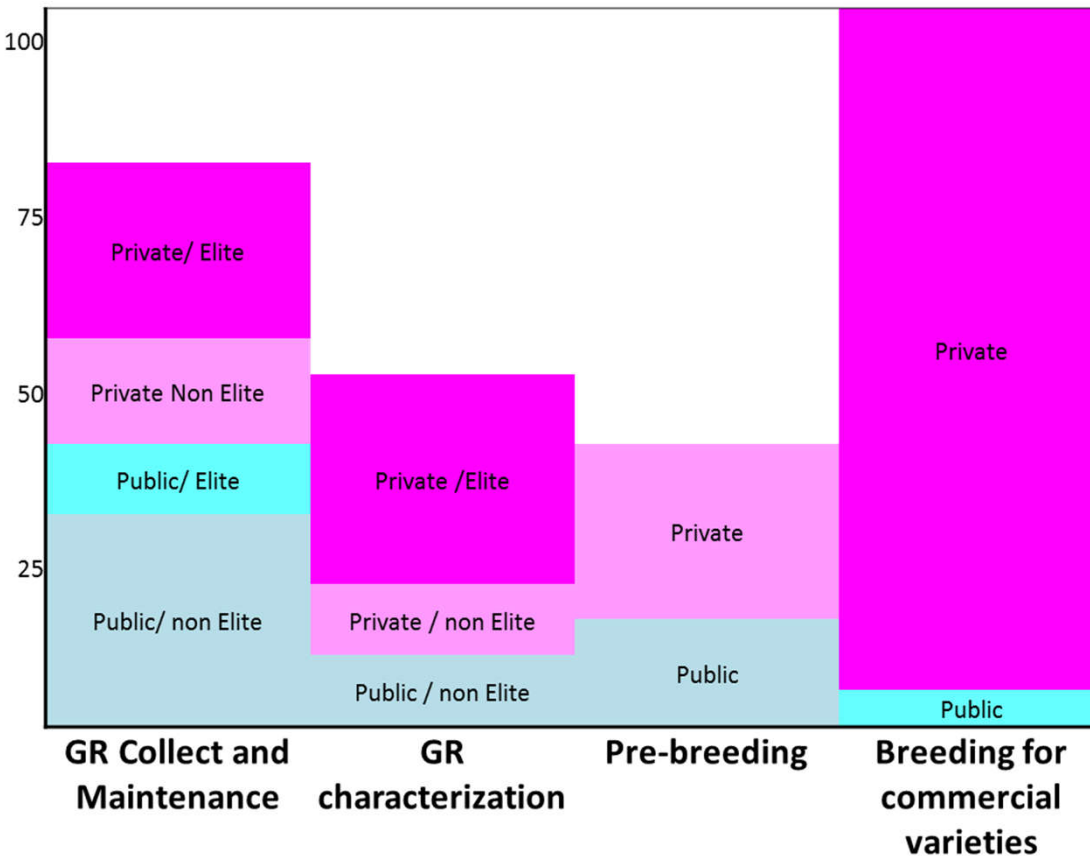
Examples of contribution to conservation by ESA members



- <https://www.euroseeds.eu/voluntary-benefit-sharing-activities-european-seed-industry>

Enforcement on Pre-breeding phase needed

Research Effort



- Use of GR is a vector of plant improvement
- GR must be characterized to be used
- Pre-breeding program is adapted to P-P Partnership



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