

Use of plant variety protection and other IP in the development of agriculture

The perspective of an international breeding company

UPOV/USPTO "Train the trainer course" - May 6, 2015
Michael Kock

Classification: Public

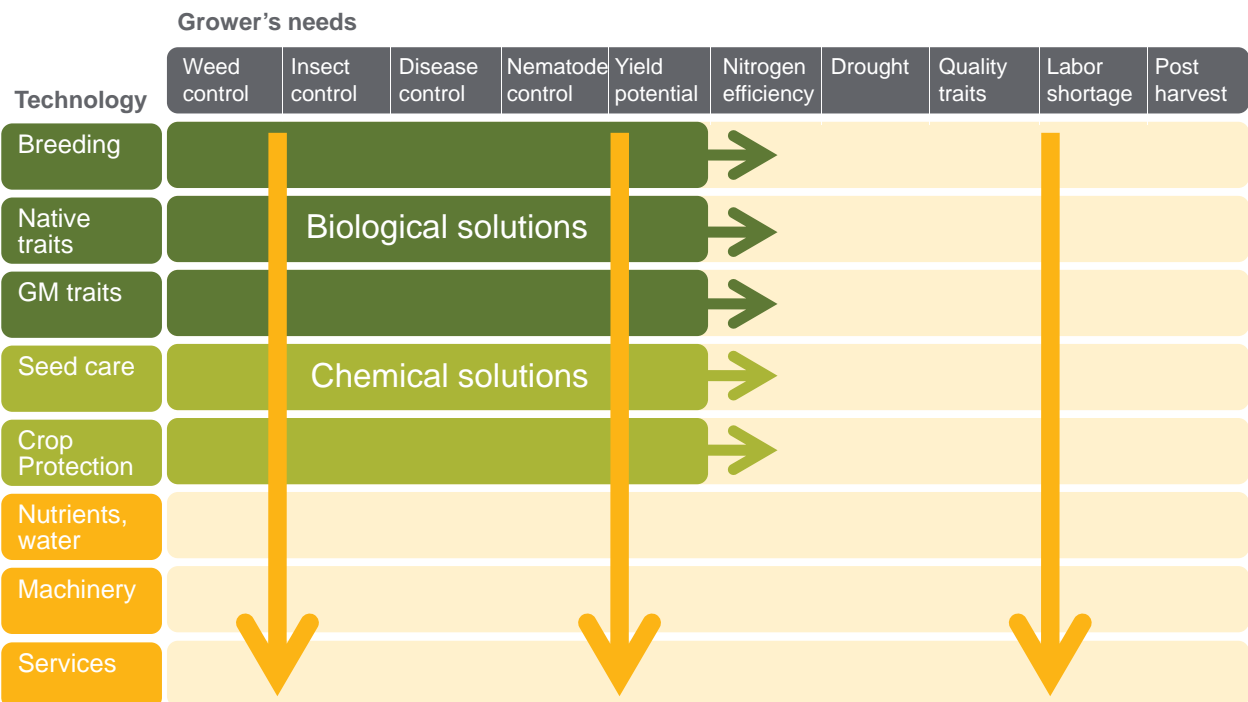
Syngenta offers tailored agronomic solutions



Syngenta ... in a glance

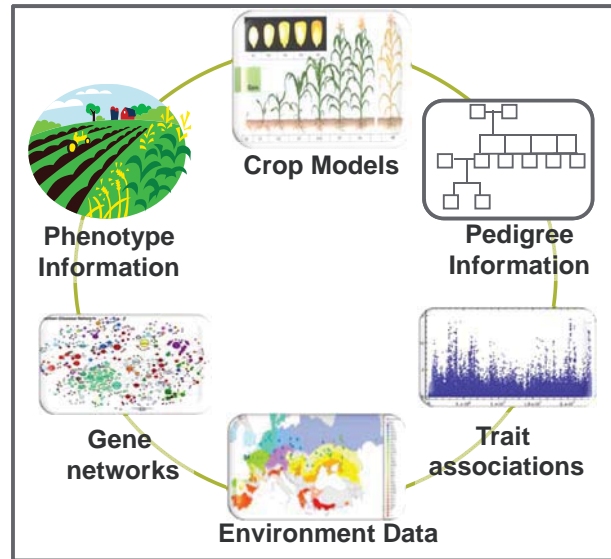


Innovating across technologies to transform the way crops are grown



Breeding: myth and reality

High technology in an easy-to-copy form



Every plant used in agriculture today is genetically modified by man
(with the exception of some wild berries and mushroom)

Example : Clubroot in Broccoli & Cauliflower

Problem: Clubroot is a devastating disease in broccoli, cauliflower, white cabbage with no solution.

Solution: Clubroot resistant broccoli by introgressing a resistance from Chinese cabbage.

The chimera was not viable. Embryo rescue and multiple backcrossing was used to establish a broccoli with the resistance gene.



Costs: 18 years; >€10m

Challenge: Starting from Syngenta's commercial variety competitors can "extract" the new trait by conventional breeding within 3 years.

Development of new plants

A lengthy and costly endeavour

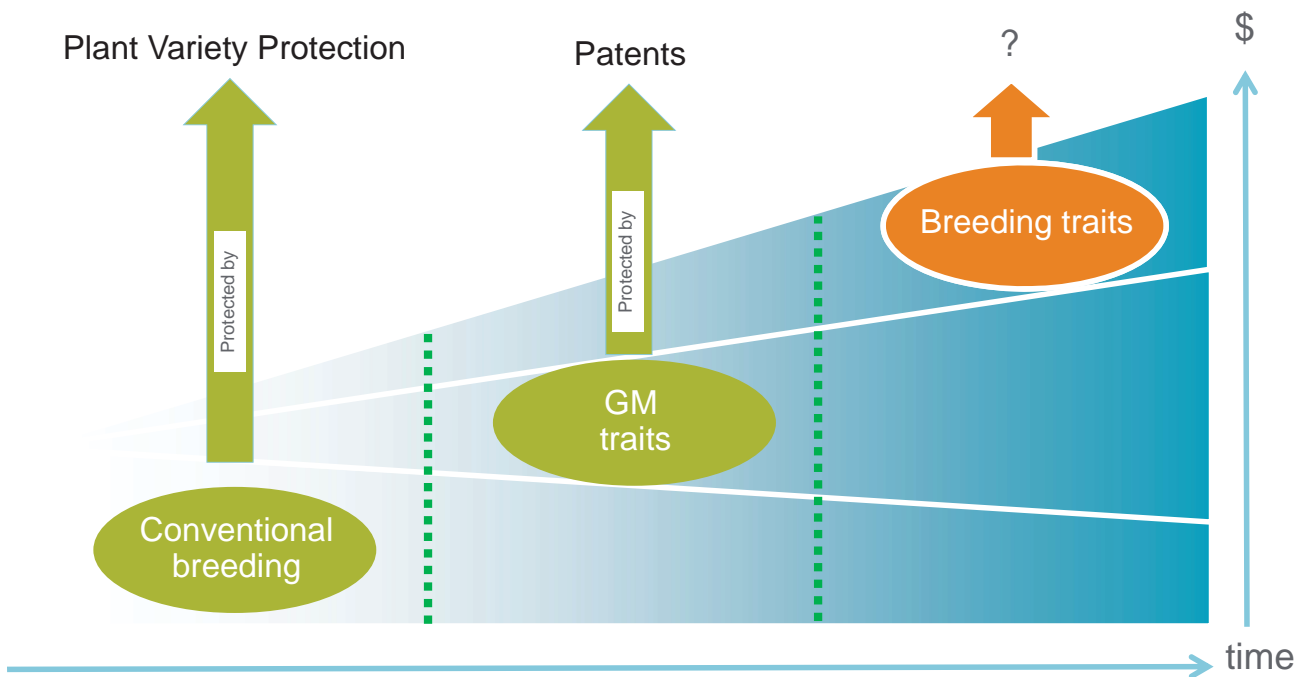


~14 Years

	Time (a)	Costs
R & D	5	\$72.9m
Regulatory Science / Registration / Regulatory	5	\$ 35.1m
Breeding	3	\$28m
Sum	13	\$136m

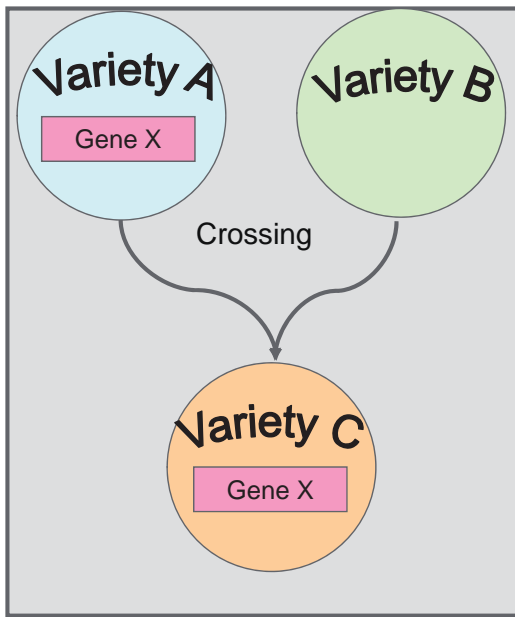
The IP tool kit

Protection of plant related innovations



Plant variety protection vs. Patents

Exclusivity is not exclusivity: Why we need both



Plant variety protection for variety A (Protection of the whole – but not the part)

- **Protects** plant variety defined by **all** characteristics.
 - **Breeders exemption**
- Efficient protection for variety A
→ No efficient protection for gene / trait X

Patent for Gene X (Protection of the part – but not the whole)

- **Protects** an invention (new gene).
 - **Limited breeders exemption** (DE, FR, NL, CH, UPC)
- Efficient protection of gene / trait X
→ No efficient protection for variety A genetics

Plant Variety Protection (PVP)

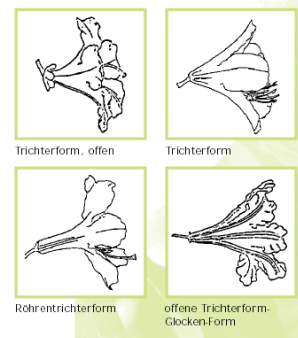
A tailor-made tool to protect breeding products

1. Prerequisites: PVP is granted for a plant variety if it is

- Distinguished** (by at least one relevant feature)
- Uniform** (low genetic variability within a population)
- Stable** (over several propagation cycles)

2. Exceptions:

- **Farm-saved-seed:** Farmers can save grain for use as seed.
 - EU: FSS is limited to certain species, farmer has to pay a fee
 - CH: FSS is free (not UPOV 91 conform)
 - Problem: Enforceability (value loss: >50% in wheat).
- **Breeders exemption:** Breeders can freely use a protected variety for breeding new varieties incl. commercialization.
 - Problem: Progress in breeding technology has shortened the breeding cycle to 30-50% over the last 20 years.
 - Copy-cat varieties can be developed very fast → Erosion of effective protection

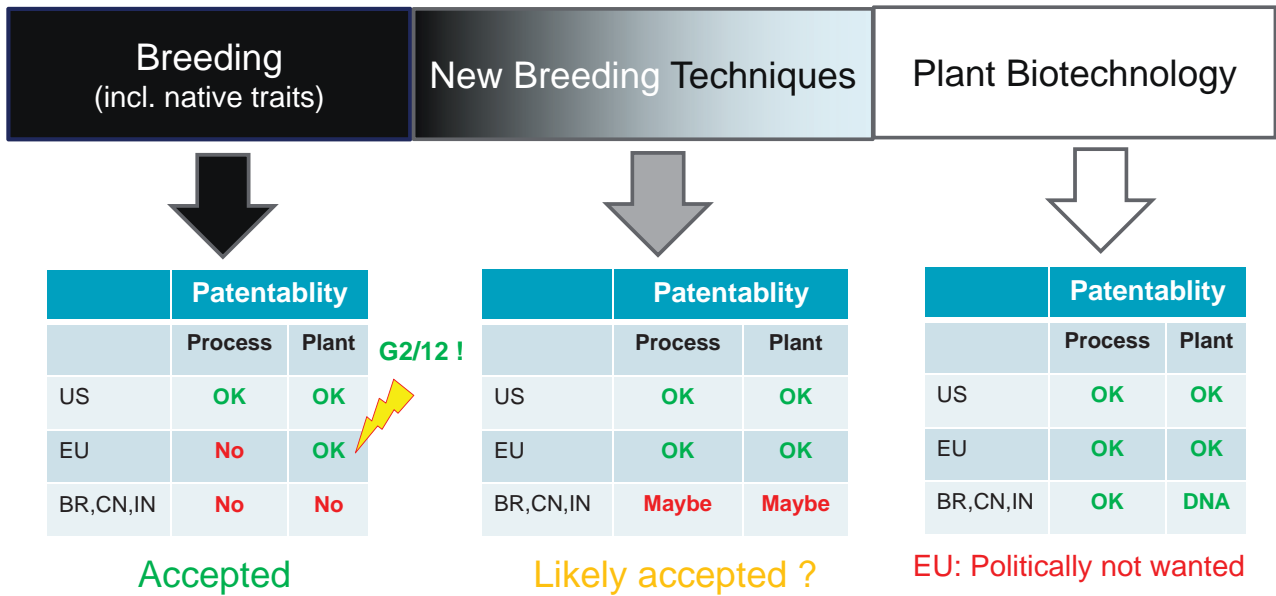


Flower forms for DUS testing of azalea

Crop	Crop Cycle	
	1990	2010
Melon	5	3
Squash	8	3
Tomato	9	3
Watermelon	10	5
Cauliflower	12	6
Eggplant	10	1.5
Wheat	12	6
Rice	9	3.5
Corn	7	5
Soybean	8	4
Sugarbeet	12	7
Sunflower	10	5

Plant Breeding & Patentability

A world in **Black & White** ?



Statutory exceptions

Large global heterogeneity

		AR	AU	BR	CA	CN	EP	US
1	Are plants directly patentable?	No	Yes	No	No	No	Yes	Yes
2	Are plants indirectly patentable through cell claims?	No	Yes	No	Yes	No	Yes	Yes
3	Are new products (oil, meal etc.) from plants patentable?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Are breeding processes patentable ?	Some	Yes	Some	Some	Some	No	Yes
5	Does the scope of a process claim extent beyond the direct product ?	No	No	No	No	No	Yes	No
6	Is a hybrid seed production process patentable ?	Some	Yes	Some	Some	Some	Some	Yes

Different countries - different claims

→ Complex global freedom-to-operate

Syngenta IP Use

Plant related patent applications

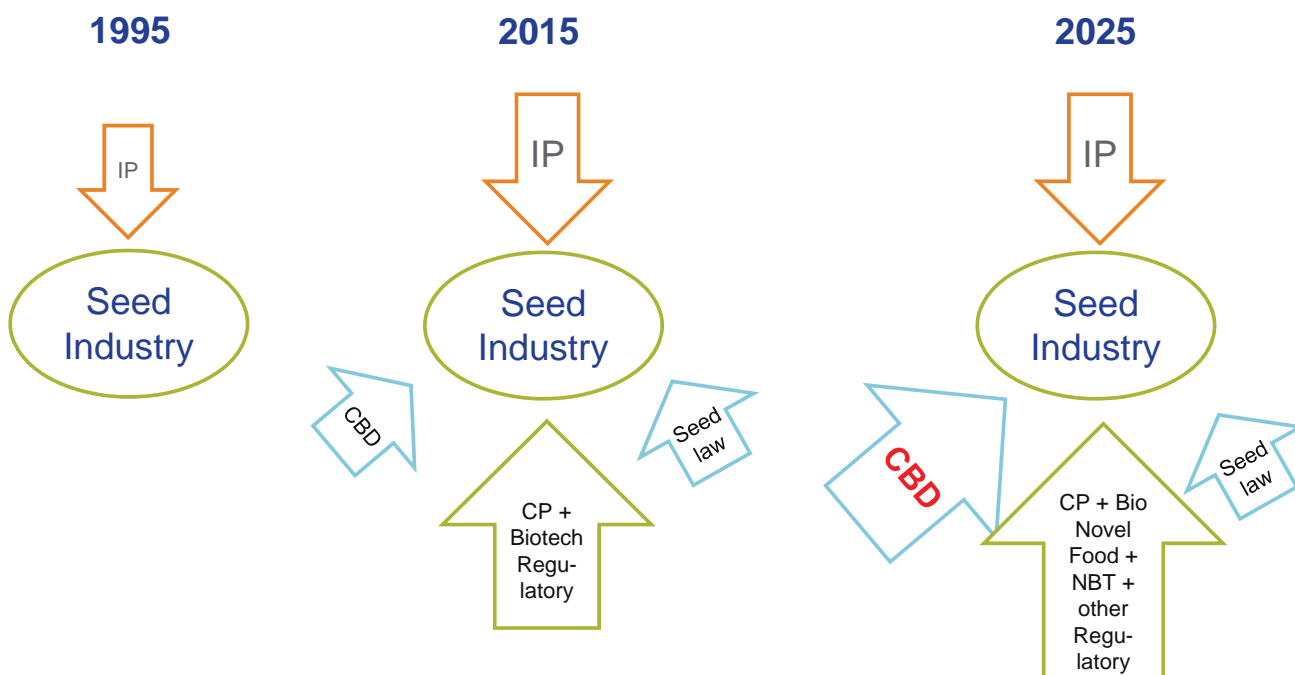
	2014
Seeds Biotech & Traits	14
US Variety Patents (seed propagated)	69
US Plant Patents (vegetatively propagated)	8

Plant variety protection applications (2014)

		PVP Application 2014					
NA	USA	69	75				
	Canada	6					
EAME	EU (CPVO)	194	312				
	Netherlands	86					
	Turkey	16					
	Morocco	5					
	Russia	3					
	Germany	2					
	Egypt	2					
	Israel	2					
	Spain	1					
	South Africa	1					
LATAM	Brazil	29	41				
	Argentina	9					
	Colombia	3					
APAC	Japan	15	32				
	S. Korea	8					
	India	2					
	China	0					
	Australia	1					
	Indonesia	0					
	Thailand	0					
	Philippines	1					
	Vietnam	5					
	Total				460		
Vegetables	Flowers	Cereals	Soybean	Corn	Others		
213	93	59	52	30	8	460	



The other side of the coin Freedom & license to operate

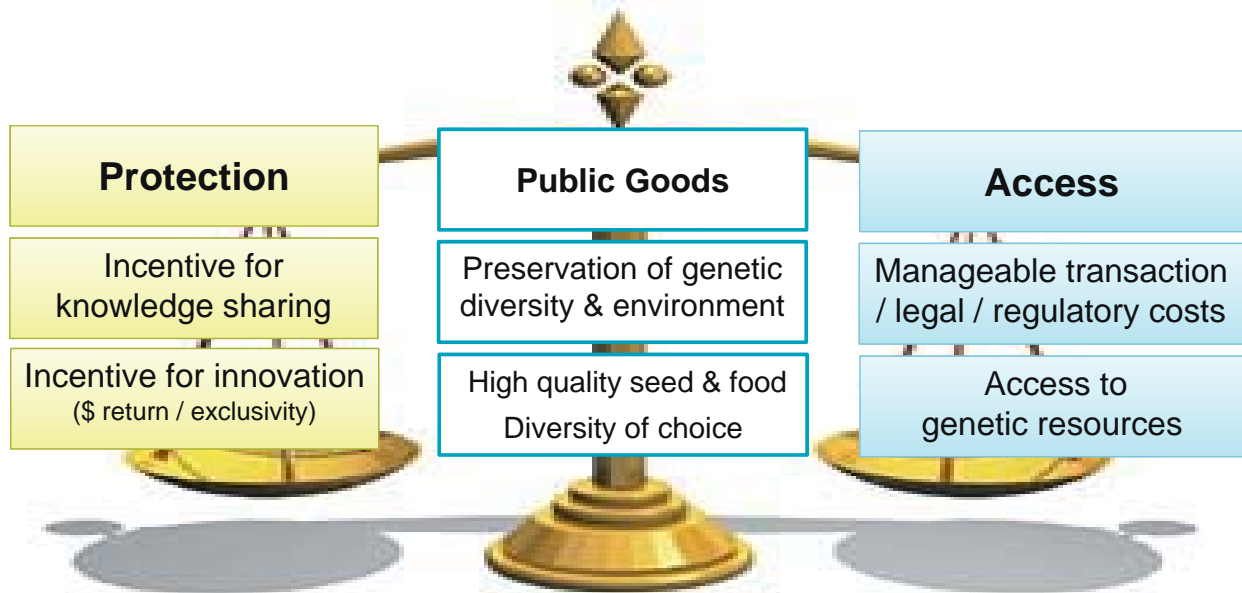


CBD: Convention on Biological Diversity

Plant related innovation

Balancing protection, access, and benefit sharing

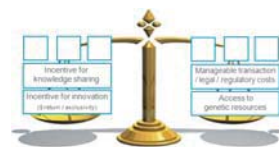
- Unprecedented need for innovation
- Increasing technification and investment
- Increasing complexity of IP, legal, and regulatory landscapes



IP is a Tool



IP is a tool



IP is a tool

A tool as such is neither good nor bad
 A tool can be used in a beneficial or problematic way

Beneficial use

- Licensing, technology dissemination, benefit sharing
- Enables “open innovation”

Beneficial effects

- Encourages innovation & R&D investment
- Encourages knowledge sharing



Problematic use

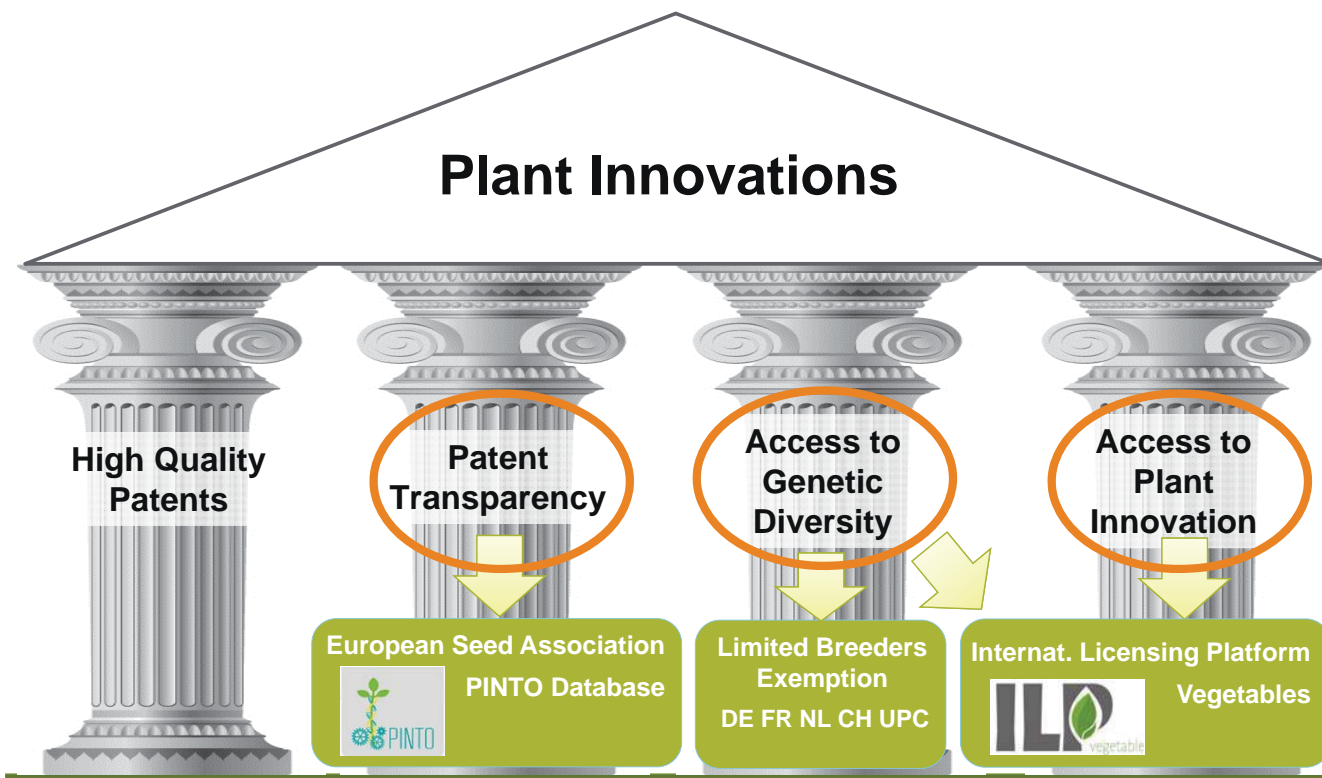
- Monopolistic / anticompetitive use (“trolls”)

Problematic effects

- Can block innovation (if without research exemption)
- Can increase transactional & legal costs

Can we minimize the problematic effects without losing the benefits ?

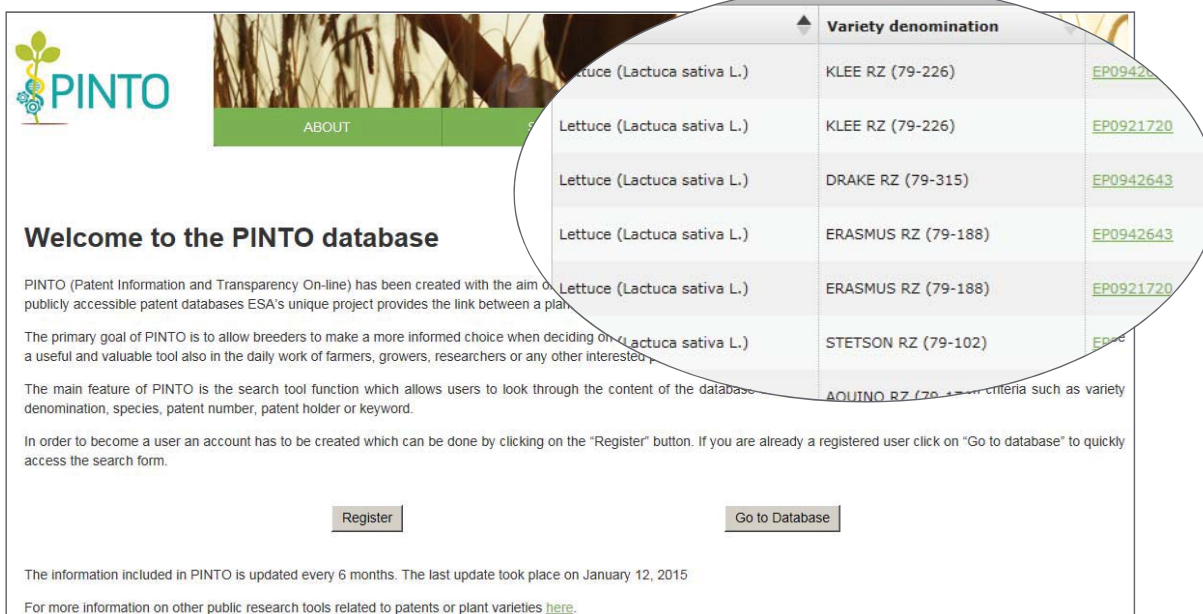
Shaping “New use of IP”



Patent Transparency

Issue: It is often difficult to find out whether a plant variety is patented.

Solution: Databank to link plant varieties to related patents.



WELCOME TO THE PINTO DATABASE

PINTO (Patent Information and Transparency On-line) has been created with the aim of providing a publicly accessible patent databases ESA's unique project provides the link between a plant variety and its associated patents.

The primary goal of PINTO is to allow breeders to make a more informed choice when deciding on a variety to develop. It is a useful and valuable tool also in the daily work of farmers, growers, researchers or any other interested party.

The main feature of PINTO is the search tool function which allows users to look through the content of the database according to criteria such as variety denomination, species, patent number, patent holder or keyword.

In order to become a user an account has to be created which can be done by clicking on the "Register" button. If you are already a registered user click on "Go to database" to quickly access the search form.

Variety denomination	Patent Number
Lettuce (Lactuca sativa L.)	KLEE RZ (79-226)
Lettuce (Lactuca sativa L.)	KLEE RZ (79-226)
Lettuce (Lactuca sativa L.)	DRAKE RZ (79-315)
Lettuce (Lactuca sativa L.)	ERASMUS RZ (79-188)
Lettuce (Lactuca sativa L.)	ERASMUS RZ (79-188)
Lettuce (Lactuca sativa L.)	STETSON RZ (79-102)

[Register](#) [Go to Database](#)

The information included in PINTO is updated every 6 months. The last update took place on January 12, 2015.
For more information on other public research tools related to patents or plant varieties [here](#).

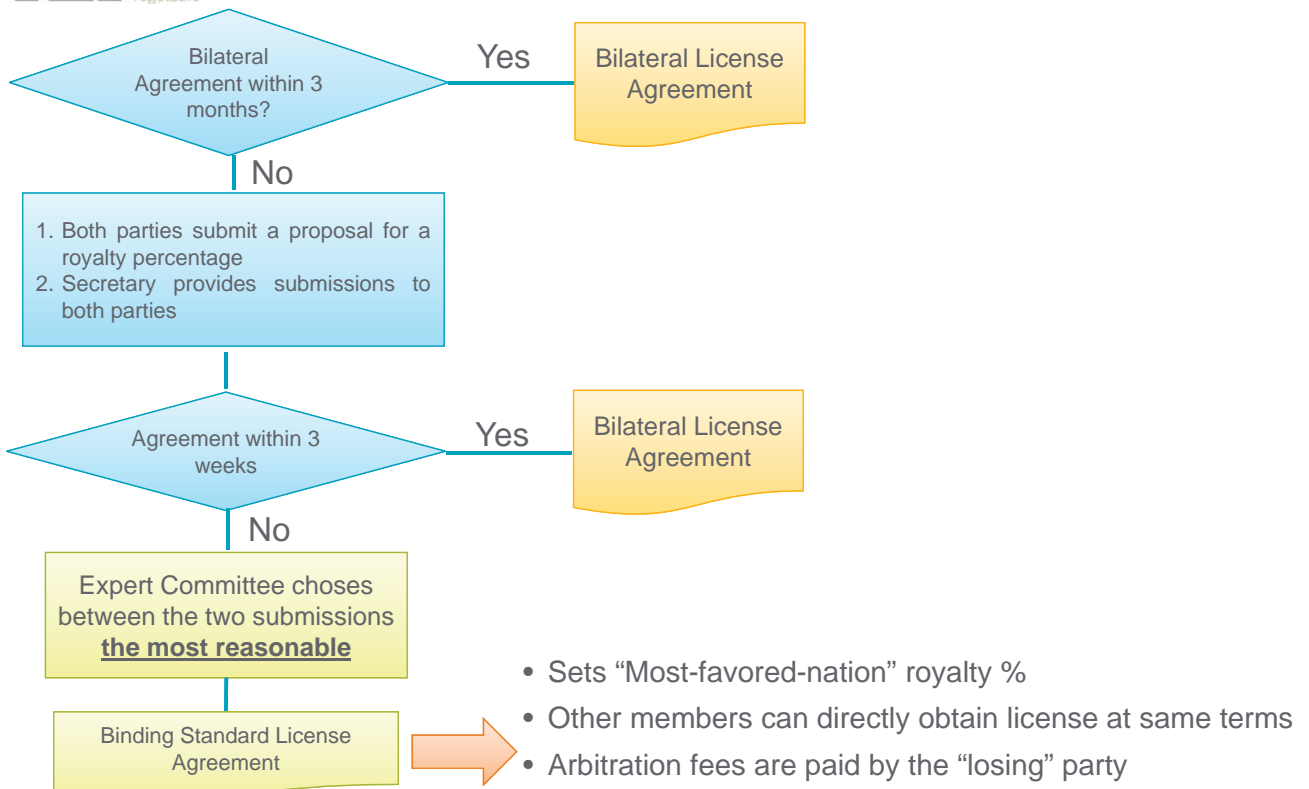
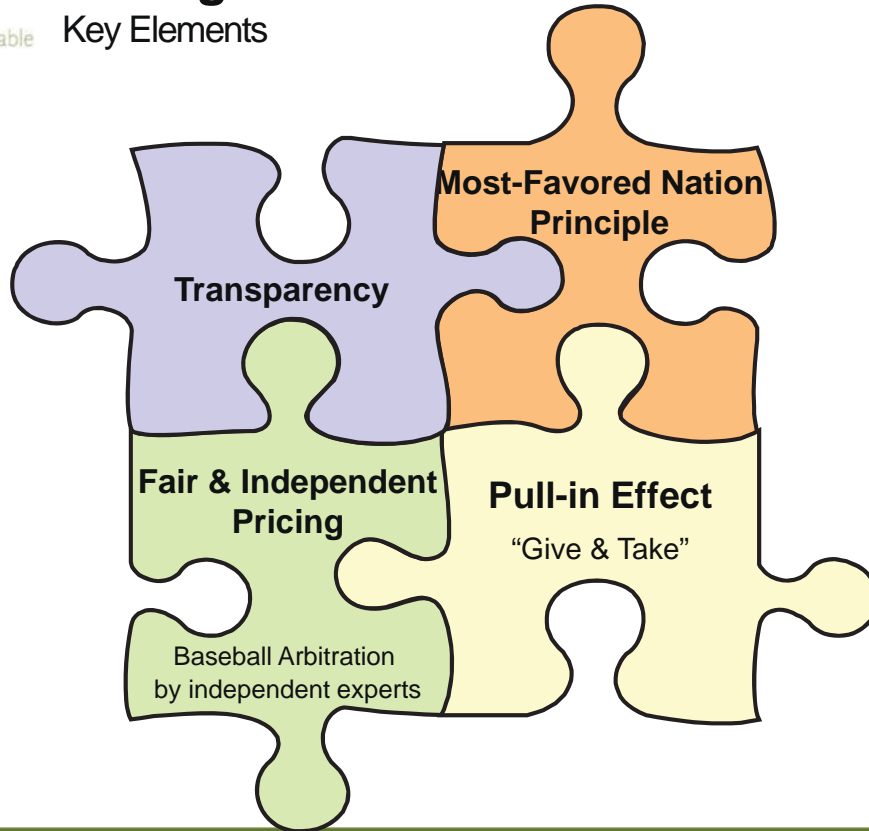


International Licensing Platform - Vegetables

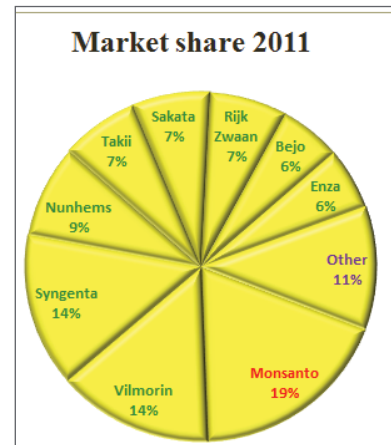
Basic principle: "Free access but not access for free"

- No obstruction of breeding material through patents
- Limited to vegetable "non-regulated" traits and variety patents
- Contractual breeders exemption: right to use legally available material for breeding and commercializing new varieties (excludes the use of patented technology e.g., markers)
- Reasonable, independent reviewable remuneration for patent holder
- Fast and pragmatic baseball arbitration of remuneration disputes
- Consistent with competition law
- Broad stakeholder acceptance





- 4 years of negotiations
- Launched Nov. 12, 2014
- Currently 11 members
(60% vegetable seed market share)
 - Agrisemen, Bayer, Bejo, Enza, Holland-Select, Limagrain, Limgroup, Pop Vriend, Rijk Zwaan, Syngenta, Takii
- 8 Parties in the process of joining the ILP.
- Estate: approx. 120 patent families
(60% of the relevant patents in the vegetable field)



Thank you very much !



Bringing plant potential to life