



nak! tuinbouw

PVP – Impact and implementation in the Netherlands

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10th East Asia Plant Variety Protection Forum Meeting
Department of Agricultural Research, Nay Pyi Taw, Myanmar
12 September 2017

Contents

- **History of Plant Breeding in The Netherlands**
- **Plant Variety Protection in The Netherlands**
- **Benefits of Plant Variety Protection**



The Netherlands

Total area

The Netherlands: 33,543 km²

Myanmar: 676,578 km²

Japan: 377,972 km²

Population density

The Netherlands: 413/km²

Myanmar 76/km²

Japan 336/km²

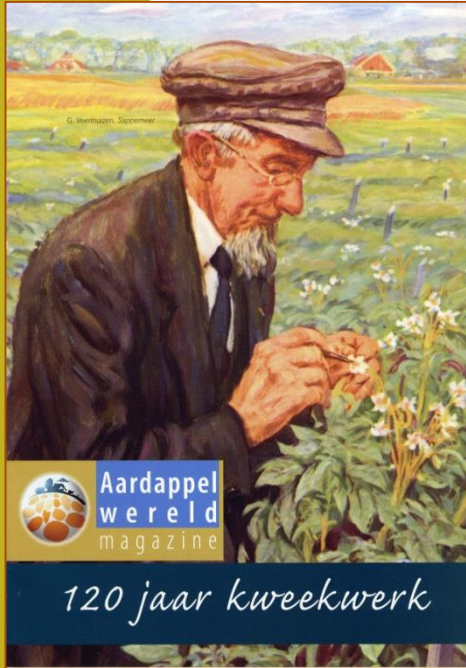


One third of its area is under sea level

Motto “how to do more
with less”

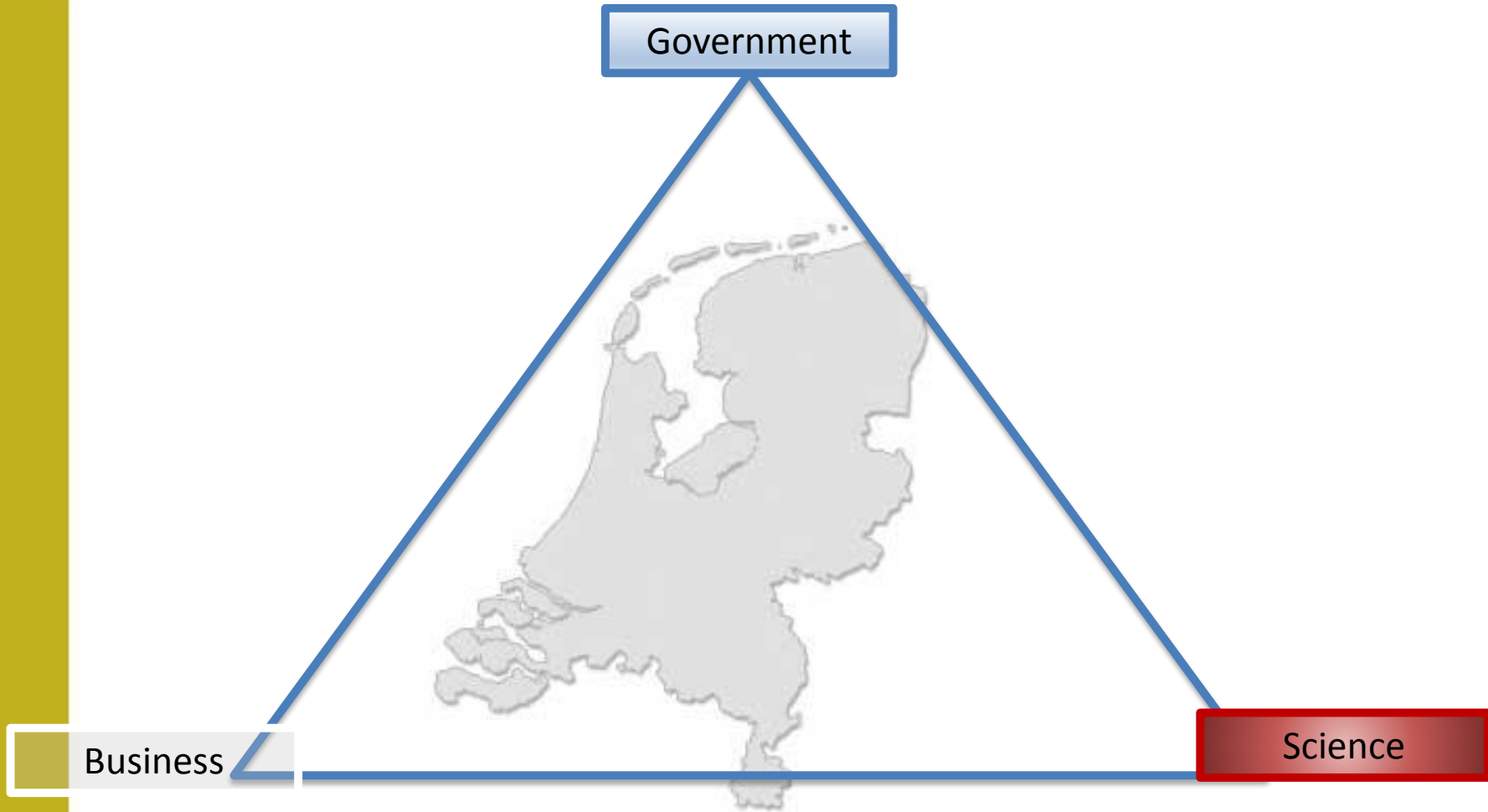
From farmer to formal seed system

- Netherlands



- Farmer breeding
- 1900 - 1943 Public and private breeding
- 1934 - 1942 Breeders' compensation fund
- 1942 - 1967 Breeders' decree
- 1967 - 2005 Seeds and Plant Materials Act
- 1968 Accession to UPOV
- 1995 EU Plant Breeders' Rights
- 1998 Accession to UPOV 1991
- 2005 New Seeds and Plant Material Act
- Gradual process of over 100 years
- After 1945 intensification of private breeding
- Present: only private breeding

Dutch collaboration model



Plantbreeding in the Netherlands

- **Global Seed Market :**

- **Arable crops:** 40 bn \$
- **Vegetables:** 4.5 bn \$
- **Ornamentals:** 2.5 bn \$



- **Seed production in the Netherlands**

- **Arable crops:** 0.8 bn €
- **Vegetables / Ornamentals:** 2.5 bn €



Plantbreeding in the Netherlands



- **The Dutch Breeding sector - world market leader**
 - **Vegetables**
 - **Ornamentals**
 - **Potatoes**
- **24% of value of world export of seeds and propagating material from the Netherlands**

Plantbreeding in the Netherlands



The Netherlands:

- +/- 350 breeding companies
- Small and Medium Sized Enterprises
- < 30% of annual turnover - R&D
- Return on investment !



Plantbreeding in the Netherlands



Pop Vriend
Seeds



DÜMMEN ORANGE™

for you



MONSANTO



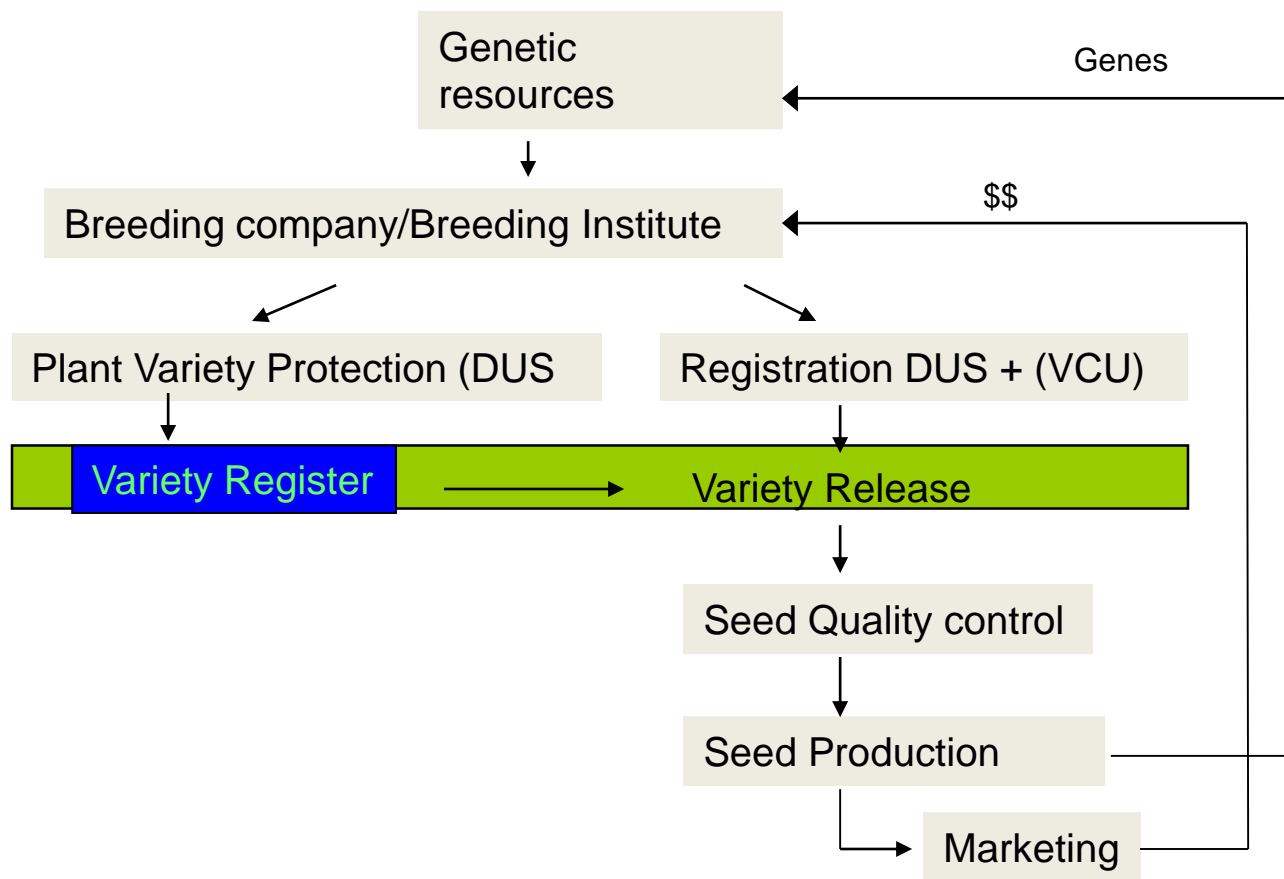
 BARENBRUG

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- **History of Plant Breeding in The Netherlands**
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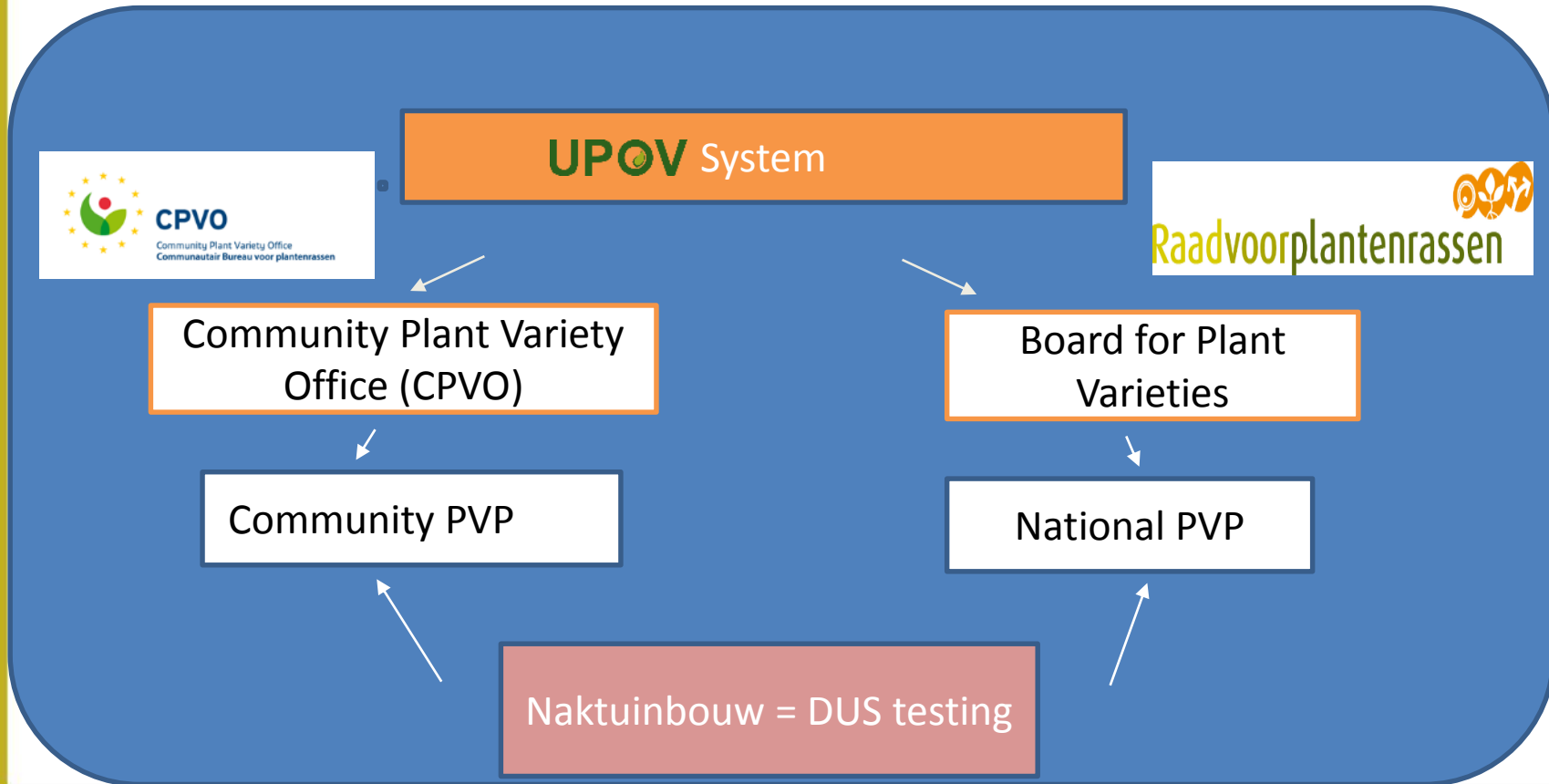


Plant Variety Protection - the Netherlands



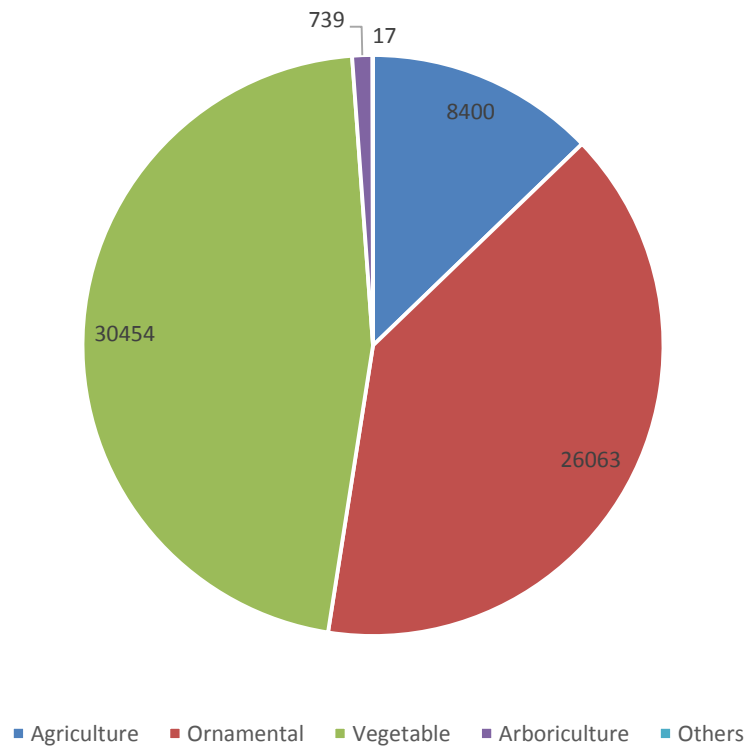
The PVP system in The Netherlands today

Two kinds of PVP: (1) Regional European Union PVP or (2) National PVP



Plant Variety Protection - the Netherlands

Total 65.673 applications since 1960 665 different species (PVP and Listing):

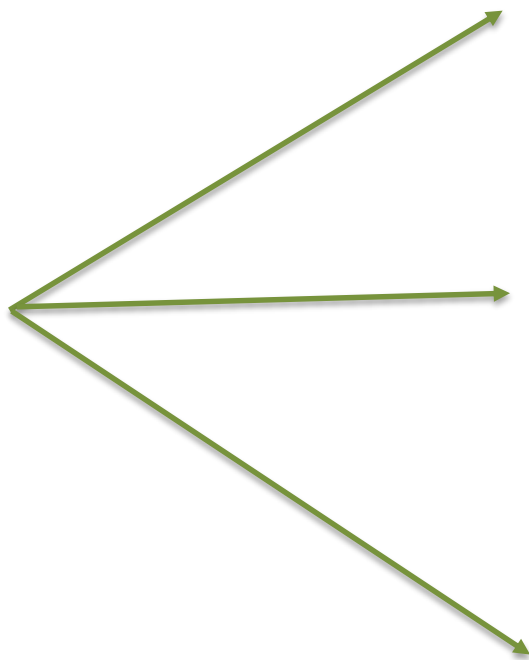


National PVP




Raadvoorplantenrassen

Board for Plant
Varieties



Independent instituut



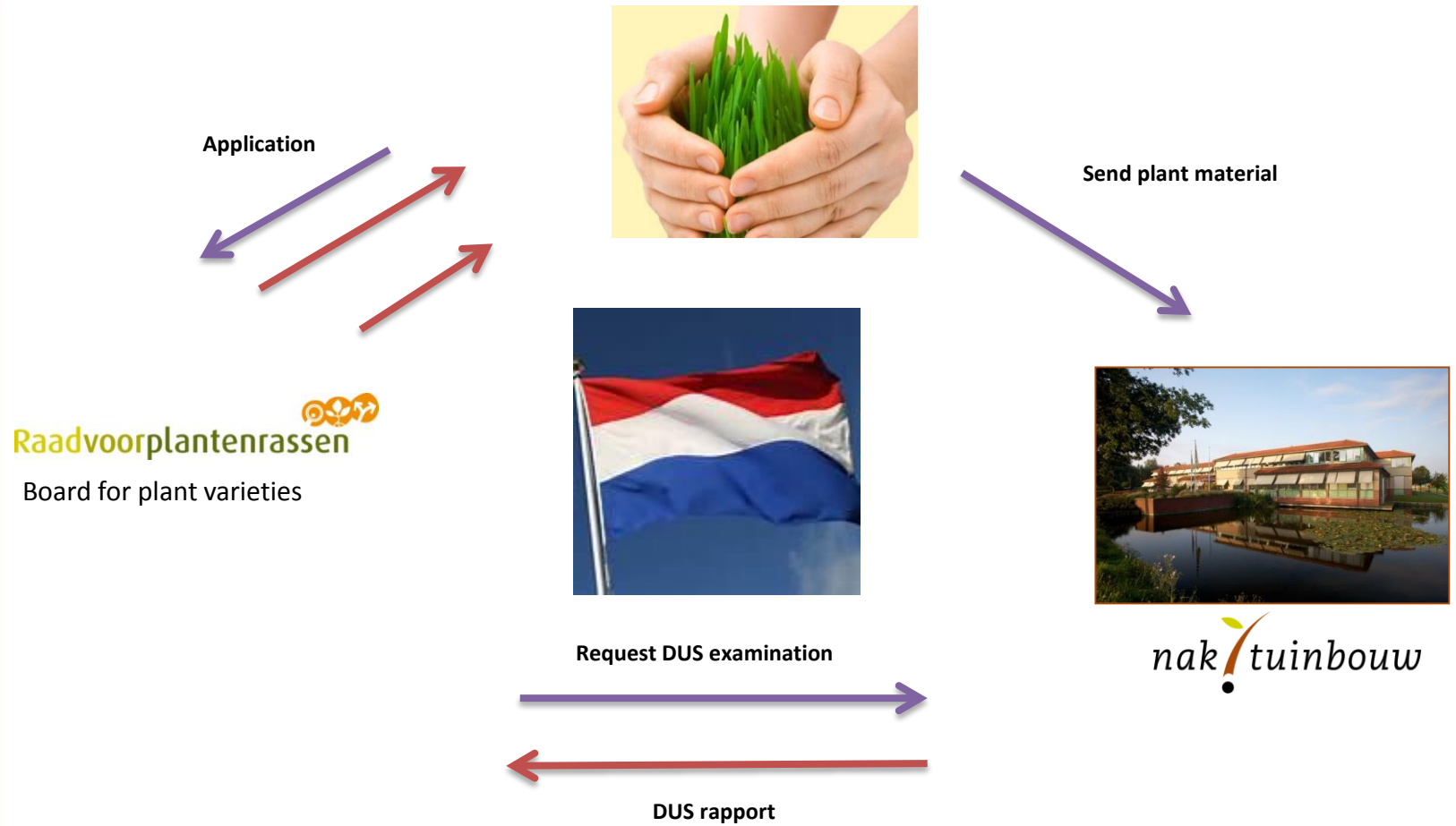
nak tuinbouw

Another Authority
(bilateral agreement)

Existing DUS test results

Take over rapport

National PVP & Listing



Board for Plant Varieties and Naktuinbouw


Raadvoorplantenrassen

Board for Plant
Varieties

Application

Decision
Title Grant
Appeals


naktuinbouw



Non technical conditions

- Denomination
- Novelty
- Payment fees

Technical conditions

- DUS station
- Testing material
- Reference material
- DUS test
- Termination of DUS test
- Reporting

Publications

- Under supervision of the Ministry of Economic Affairs, Agriculture and Innovation.
- Non-profit organisation
- Foundation
- No financing from the government
- Independent body with own board
- Activities 100% funded by the business community
- All stakeholders represented in the board



- Basic inspection according to
 - Dutch Seed and Plant Material Act and Plant Disease Act
 - European legislation
- DUS testing for National Listing, National and European Plant Variety Protection
 - Ornamental crops
 - Agricultural crops
 - Vegetable crops



Number of applications

2016


Ornamentals:	813
Dutch Plant Breeders' Rights	232
EU Plant Breeders' Rights	581
Vegetable crops:	1.273
National listing	676
Dutch Plant Breeders' Rights	486
EU Plant Breeders' Rights	111
Agricultural crops:	341
National listing	251
Dutch Plant Breeders' Rights	82
EU Plant Breeders' Rights	8
Total	2427



Guidance for DUS Examination

CPVO Technical Protocols

CPVO-TP(11/17) Rev.
Date: 19/03/2014



CPVO-OCVV
Coördinatie Plantsoorten Ondernemers
Office of Communication and Variety Protection

PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

Cucurbita pepo L.

VEGETABLE MARROW, SQUASH

UPOV Code: CUCUR_PEP

Adopted on 19/03/2014

Entry into force on 19/03/2014

1

184 Protocols

UPOV Technical Guidelines

E

UPOV

TG/76/8
ORIGINAL: English
DATE: 2006-04-05

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

**SWEET PEPPER, HOT PEPPER,
PAPRIKA, CHILI**

UPOV Code: CAPSI_ANN

Capiscium annuum L.

**GUIDELINES
FOR THE CONDUCT OF TESTS
FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

Alternative Names:^{*}

Botanical name	English	French	German	Spanish
<i>Capiscium annuum</i> L.	Sweet Pepper, Hot Pepper, Paprika, Chili	Piment, Poivron	Paprika	Aji, Chile, Pimiento

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

318 Guidelines

National Protocols

Astribe Buch-Ham. ex G.Don.

Simplified standard protocol: NL/ABE/4

Botanical taxon: *Astribe Buch-Ham. ex G.Don.*
Common Name (when known): Astribe
Date of preparation of TP: 2007; Revision 6-07-2012
TP data prepared by: ing. W.A. Wietsma

Sample to be examined: VEGETATIVE
Number of foreseen growing cycles: 1 year

Closing date for applications: 1/12
Submission date/period: 14 - 30/4
Seed/Plant Country: 24 young plants of commercial standard
Seed/Plant Quality: appropriate to be grown in the open

Special conditions sample:

Test station address: Test station Nergesa, Bornsesteeg 10, 6721 NG Bunnik
Name/Email/Tel./Contact person: C. Grashoff 0117.477221, kees.grashoff@wur.nl

List of grouping characteristics: NO, (if yes put as annex)
Minimum number of plants in trial: vegetative: 20 seed: not appl.
Maximum number of plants observed by measuring or counting: vegetative: 1 seed: not appl.

Give description of when observations on the flower should take place: at full flowering
Give description of when/where observations on the leaf should take place: at full flowering
Give description of when/where the other observations should take place: at full flowering

Test will take place: IN THE OPEN, under conditions to protect the plants against full sun light

Uniformity: Population Standard used: 1%

Table of characteristics: PRESENT (see annex)
(if present, please annex the table of characteristics and explanations)

Literature: PRESENT
(when present, please annex to this document)

Page 1 of 3

ca. 240 National protocols

Submission of the samples


Raadvoorplantenrassen
Board for Plant
Varieties

-
- Closing dates
 - Amount and Quality
 - Examination Office



1. Appropriately packaged
2. Clearly labelled
3. Must be submitted in the specified period, number and conditions.
4. Clean of pests and diseases.
5. Untreated with insecticides, fungicides or any other treatment.



Preparation of the trials

- Test design
 - Layout, number of plants in test
 - replications
 - allowing removal of plants or parts of plants
 - Number of plants/parts of plants to be examined
- Additional tests
- Number of growing cycles



DUS Examination: a challenge



Description of the variety

- Using the table of characteristics of the CPVO protocol/UPOV guideline/National guideline.



CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
30. (+)	30.		Fruit: general shape		
			disc shaped		1
			transverse elliptical		2
			transverse broad elliptical		3
			globular		4
			top shaped		5
			broad elliptical		6
			ovate		7
			elliptical		8
			cylindrical		9
			pear shaped		10
			bottle shaped		11
G			club shaped		12
31.1	31.1		Only Scallop type varieties: Fruit: length		
			short	Bennings Green Tint	3
			medium	Sunburst	5
	long	Yellow Bush Scallop	7		
31.2	31.2		Only Acorn type varieties: Fruit: length		
			short	Table Gold	3



Applicants visiting the trial



Reporting

Interim report:

interim report: mid-term on
D, U and S.

TUSSENRAPPORT OVER HET TECHNISCH ONDERZOEK IN HET KADER VAN TOELATING EN KWEKERSRECHT INTERIM REPORT ON THE TECHNICAL EXAMINATION IN THE FRAMEWORK OF LISTING AND PLANT BREEDERS' RIGHTS

1.	Verwijznummer rapporterende autoriteit Reference no. reporting authority	KBLO0895
2.	Opdrachtgevende autoriteit Requesting authority	
3.	Verwijznummer opdrachtgevende autoriteit Reference no. requesting authority	
4.	Voorlopige aanduiding Breeder's reference	Bejo 2861 Hybride / Hybrid
5.	Aanvraagdatum Date of application	24-02-2012
6.	Aanvrager Applicant	Bejo Zaden B.V., WARMENHUIZEN, NL
7.	Gemachtigde Agent	
8.	Botanische gewasnaam Botanical name of taxon	Brassica oleracea L. convar. botrytis (L.) Alef. var. botrytis L.
9.	Nederlandse gewasnaam Common name of taxon	Bloemkool / Cauliflower
10.	Rasbenaming Variety denomination	
11.	Kweker Breeder	Bejo Zaden B.V., WARMENHUIZEN, NL
12.	Onderzoeksautoriteit Testing authority	Naktuinbouw, NL
13.	Onderzoeksstation en -plaats Testing station and place	Naktuinbouw, ROELOFARENDSEVEEN, NL
14.	Periode van onderzoek Period of testing	2012
15.	Datum en plaats uitgifte rapport Date and place of issue of document	15-08-2013, ROELOFARENDSEVEEN, NL
16.	Algemene informatie General information	
	a. Geen plantmateriaal ontvangen No plant material received	<input type="checkbox"/>
	b. Voldoet niet aan de inleverseisen Requirements for plant material not met	<input type="checkbox"/>
	c. Onderzoek mislukt, waarnemingen Test failed, observations	<input type="checkbox"/>

Reporting

Final report: situation at the end of the DUS test, decision on D,U and S

		nak tuinbouw
EINDRAPPORT OVER HET TECHNISCH ONDERZOEK IN HET KADER VAN TOELATING EN KWEEKERSRECHT FINAL REPORT ON THE TECHNICAL EXAMINATION IN THE FRAMEWORK OF LISTING AND PLANT BREEDERS' RIGHTS		
1.	Verwijsnummer rapporterende autoriteit Reference no. reporting authority	KBL895
2.	Opdrachtgevende autoriteit Requesting authority	
3.	Verwijsnummer opdrachtgevende autoriteit Reference no. requesting authority	
4.	Voorlopige aanduiding Breeder's reference	Bejo 2961 Hybride / Hybrid
5.	Aanvraagdatum Date of application	24-02-2012
6.	Aanvrager Applicant	Bejo Zaden B.V., WARMENHUIZEN, NL
7.	Gemachtigde Agent	
8.	Botanische gewasnaam Botanical name of taxon	Brassica oleracea L. var. botrytis (L.) Alef. var. botrytis L.
9.	Nederlandse gewasnaam Common name of taxon	Bloemkool / Cauliflower
10.	Rasbenaming Variety denomination	Cartagena
11.	Kweker Breeder	Bejo Zaden B.V., WARMENHUIZEN, NL
12.	Onderzoeksautoriteit Testing authority	NakTuinbouw, NL
13.	Onderzoekstation en -plaats Testing station and place	NakTuinbouw, ROELOFARENDSEVEEN, NL
14.	Periode van onderzoek Period of testing	2012-2013
15.	Datum en plaats uitgifte rapport Date and place of issue of document	25-09-2014, ROELOFARENDSEVEEN, NL

1/2

		Verwijsnummer rapporterende autoriteit: KBL895	nak tuinbouw	
15. Kenmerken uit het protocol of richtlijn Characteristics included in the protocol or guideline				
CPVO CPVO No.	Kenmerken Characteristics	Expressie States of expression	Klasse Note	Opmerkingen Remarks
1	Kiemplant: anthocyaankleuring hypocoetyl <i>Seedling: anthocyanin coloration of hypocotyl</i>	aanwezig <i>present</i>	9	
2	Plant: hoogte (bij oogstrijpheid) <i>Plant: height (at time of harvest)</i>	midden <i>medium</i>	5	
3	Stronk: lengte (tot de eerste bladaanzet) <i>Stem: length (up to the insertion of first leaf)</i>	kort <i>short</i>	3	
4	Blad: houding <i>Leaf: attitude</i>	halfopgericht <i>semi-erect</i>	3	
5	Blad: lengte <i>Leaf: length</i>	midden tot lang <i>medium to long</i>	6	
6	Blad: breedte <i>Leaf: width</i>	midden <i>medium</i>	5	
7	Blad: verhouding breedte/lengte <i>Leaf: ratio width/length</i>	midden <i>medium</i>	5	
8	Blad: gelobdheid <i>Leaf: lobbing</i>	ontbrekend <i>absent</i>	1	
9	Blad: kleur (met was, indien aanwezig) <i>Leaf: color (with wax if present)</i>	grijsgroen <i>grey green</i>	2	
10	Blad: kleurintensiteit (als bij 9) <i>Leaf: intensity of color (as for 9)</i>	donker <i>dark</i>	7	
11	Blad: draaiing van de top <i>Leaf: twisting of tip</i>	zwak <i>weak</i>	3	
12	Blad: vorm in dwarsdoorsnede <i>Leaf: shape in cross-section</i>	vlak <i>flat</i>	2	
13	Blad: bobbeling <i>Leaf: blistering</i>	zwak <i>weak</i>	3	
14	Blad: plooiing bij de hoofdnerf <i>Leaf: crimping near main vein</i>	zwak tot midden <i>weak to medium</i>	4	
15	Blad: golving rand <i>Leaf: undulation of margin</i>	zwak <i>weak</i>	3	
16	Kool: afdekking door het binnenblad <i>Curd: covering by inner leaves</i>	gedeeltelijk gedekt <i>partly covered</i>	2	
17	Kool: hoogte <i>Curd: height</i>	midden <i>medium</i>	5	
18	Kool: diameter <i>Curd: diameter</i>	midden <i>medium</i>	5	
19	Kool: vorm in lengtedoorsnede <i>Curd: shape in longitudinal section</i>	rond <i>circular</i>	1	
20	Uitgezonderd rassen met een driehoekige koolvorm: Kool: welving <i>Excluding varieties with curd shape triangular: Curd: doming</i>	midden <i>medium</i>	5	
21	Kool: kleur <i>Curd: colour</i>	witachtig <i>whitish</i>	1	
22	Kool: bonkigheid	fijn tot midden	4	

2/4

Plant Variety Protection - the Netherlands

Farmers Rights

Sub-sistence farmers (private and non-commercial use)

- not present in the Netherlands

Farm Saved Seed (Farmers Privilege)

- Cereals - Potatoes
- Small farms
 - Information
 - exempted from payment
- Online system

<https://www.eigenzaaizaad.nl/eigen-zaaizaad-fss/>



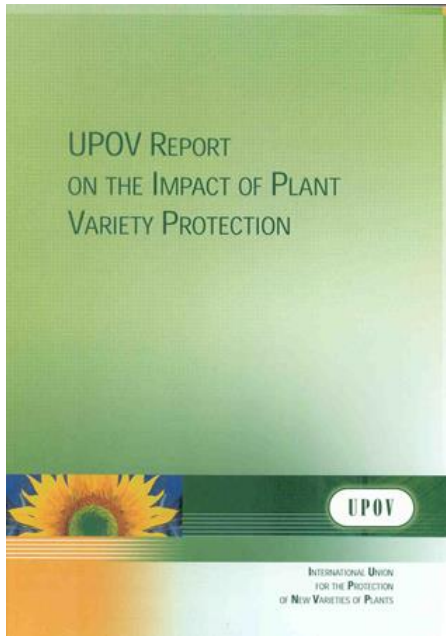
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- **Benefits of Plant Variety Protection System**



Benefits of PVP system

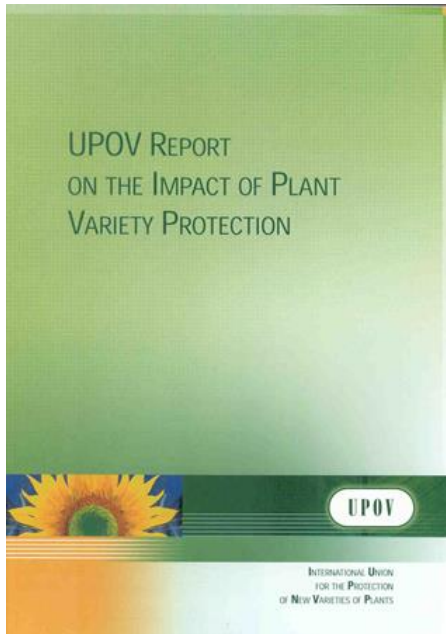
Results – UPOV report 2005



- UPOV study
- Based on empirical analysis before and after UPOV membership
- Participating countries
 - Argentina
 - China
 - Kenya
 - Poland
 - Republic of Korea

Benefits of PVP system

Results – UPOV report 2005



- Strong uptake of protected varieties
- Increased number of new varieties
- Improvement of varieties
- Introduction of foreign varieties
- Domestic breeding
 - Number of breeding entities and varieties increased
 - Type of breeders changed



Benefits of PVP system

Socio–economic impact of Plant Breeding in the EU (Noleppa report)

- **Increasing yields**
- Improving market conditions
- Increasing potential world food supply
- **Generating economic prosperity and increasing social welfare**
- Creating additional farm income and securing agricultural jobs
- Improving the agricultural trade balance
- Minimising net virtual land imports
- Reducing CO2 emissions
- Preserving biodiversity
- Saving agricultural water resources

Benefits of PVP system

Socio-economic impact of Plant Breeding in the EU (Noleppa report)

ENSURING FOOD SECURITY



Thanks to plant breeding, every year farmers in the EU grow an extra:

- 22 million tons of Wheat**
- 3.3 million tons of Oilseed rape**
- 10 million tons of Potatoes**

SECURING RURAL INCOMES AND JOBS



The benefits of better harvests have included:

- A contribution of more than €14bn to EU GDP**
- 1.2 million farm workers earn on average €7,000 more annually**



KEEPING FOOD COSTS DOWN



Without the last 15 years of plant breeding advances:

- Wheat and Potatoes would cost 7% more**
- Sunflower products would cost 8% more**

ENSURING SUSTAINABILITY



Through plant breeding, Europe has:

- Prevented biodiverse habitat the size of Latvia being turned into farmland**
- Saved enough water to fill 22 million Olympic swimming pools**



Bron. <http://www.plantetp.org/hffa-research-paper-plant-breeding-eu>

Bron. Pictures: ESA press release

Benefits of PVP system

WHEAT

Thanks to plant breeding over the last 15 years, EU wheat harvests have grown by more than 22 million tons.

That's enough for

32

billion
loaves
of bread



64

loaves for
every person
in the EU!



A world without plant breeding would mean less food security and higher prices.

Research source: <http://bit.do/plantetp-HFFAResearch>
More info: www.plantetp.org

Bron. <http://www.plantetp.org/hffa-research-paper-plant-breeding-eu>

Bron. Pictures: ESA press release

Benefits of PVP system

WHEAT

80% of the growth in wheat harvests over the past 15 years can be attributed to plant breeding.

Other factors can include

- ... weather variations
- ... **fertilisers**
- ... plant protection products
- ... **soil conditions**
- ... or new machinery

We need plant breeding to keep food on our plates.

Research source: <http://bit.do/plantetp-HFFAResearch>
More info: www.plantetp.org

Bron. <http://www.plantetp.org/hffa-research-paper-plant-breeding-eu>

Bron. Pictures: ESA press release

Benefits of PVP system

WHEAT

Plant breeding in the last 15 years has increased **wheat harvests by 15%** keeping the cost of wheat down by

7%

which impacts the price of your bread.



Research source: <http://bit.do/plantetp-HFFAResearch>
More info: www.plantetp.org

Bron. <http://www.plantetp.org/hffa-research-paper-plant-breeding-eu>

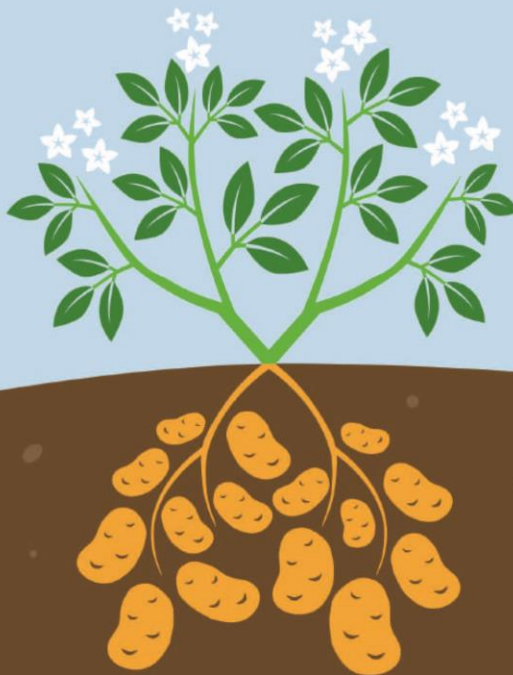
Bron. Pictures: ESA press release

Benefits of PVP system

POTATOES

Thanks to plant breeding over the past 15 years, farmers in the EU have grown an extra **10 million tons of potatoes every year.**

That's more than the annual potato output of the whole of Poland, and means the EU can export potatoes instead of importing them.



Research source: <http://bit.do/plantetp-HFFAResearch>
More info: www.plantetp.org

Bron. <http://www.plantetp.org/hffa-research-paper-plant-breeding-eu>

Bron. Pictures: ESA press release

Benefits of PVP system



Dutch study

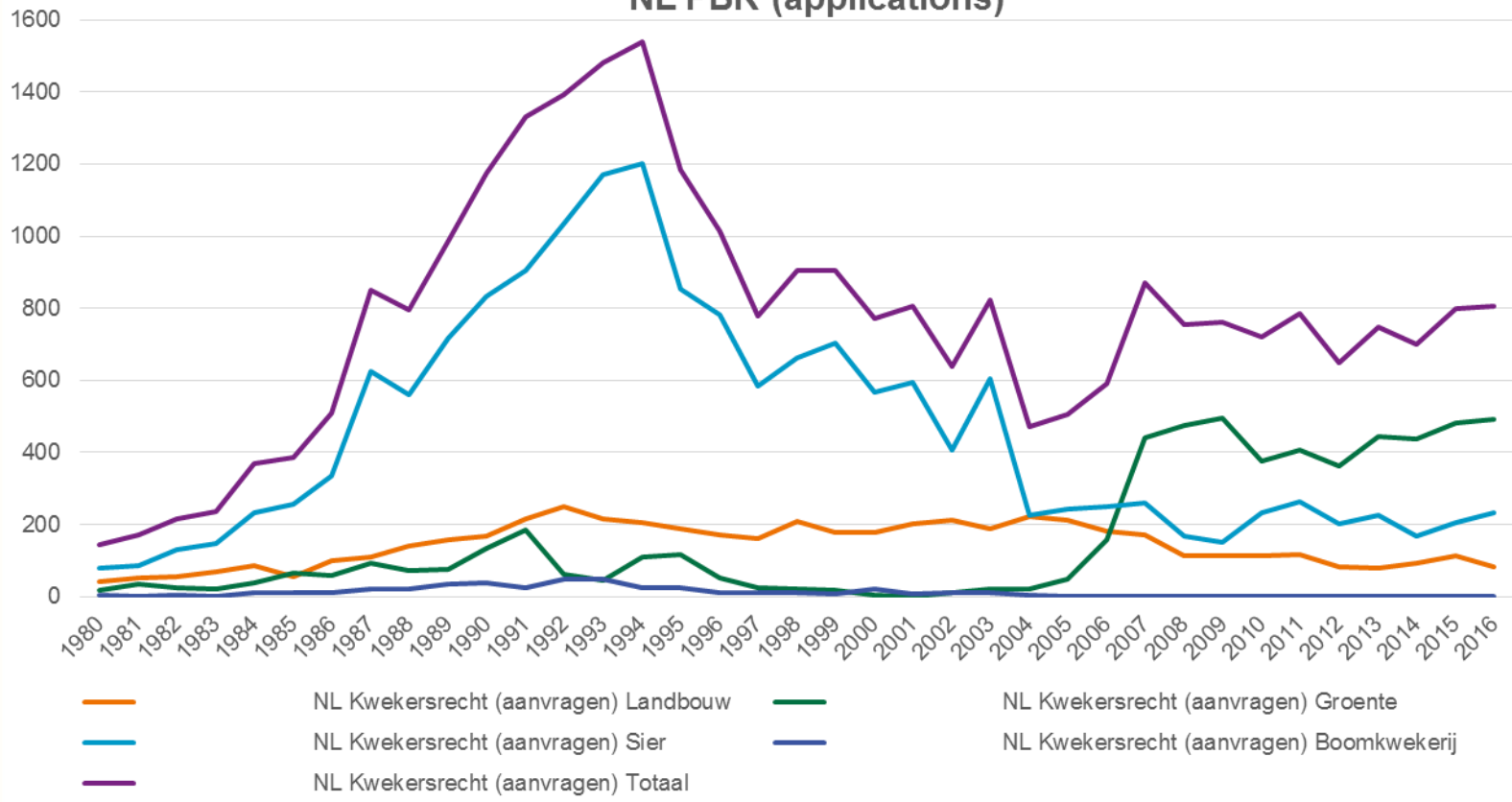
To what degree international seed companies are stimulated by Plant Variety Protection to invest in breeding and trading plant varieties

Seed = seed and vegetative plant material



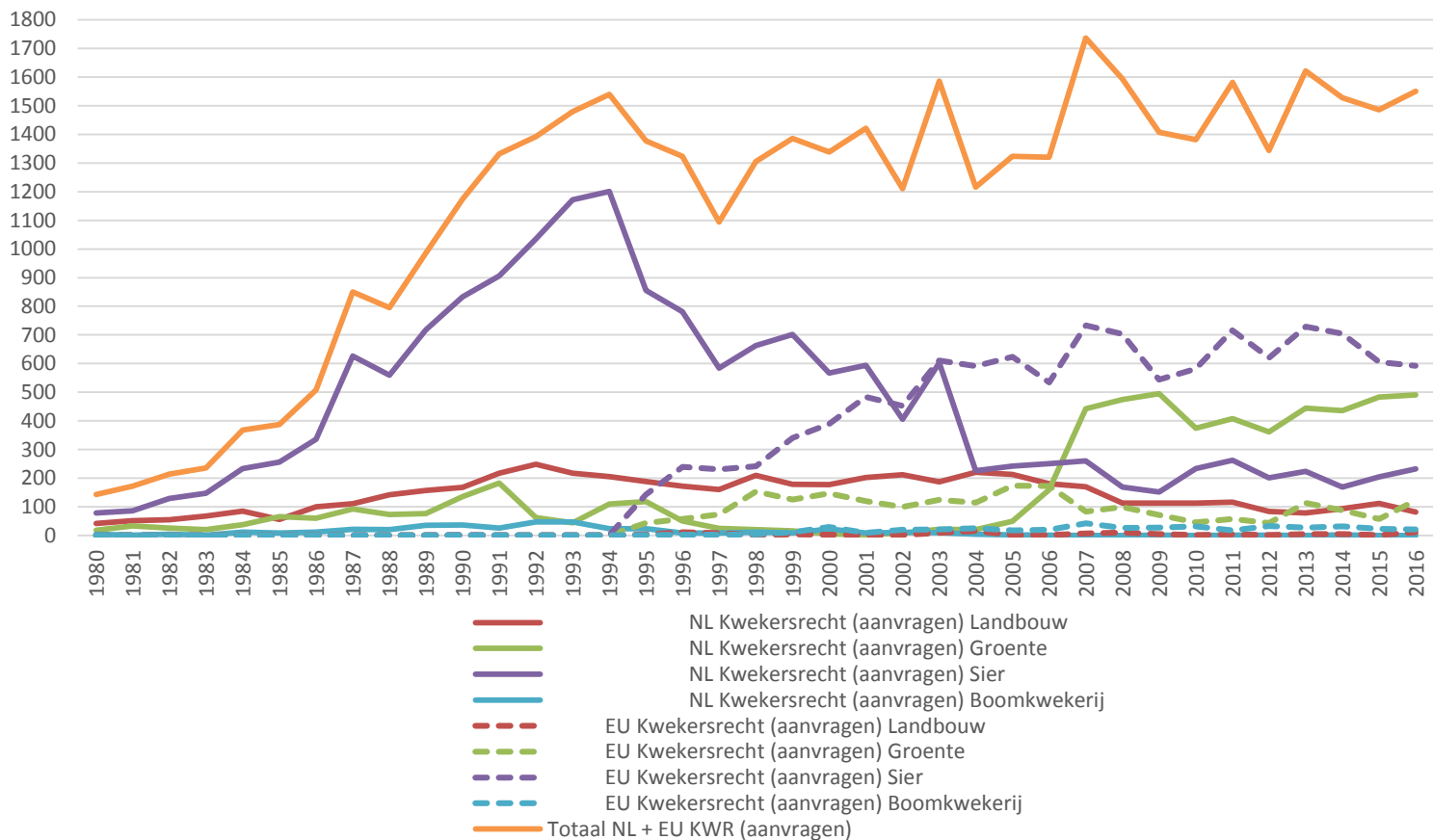


NL PBR (applications)



The “CPVO effect”

NL + EU kwekersrecht (aanvragen)

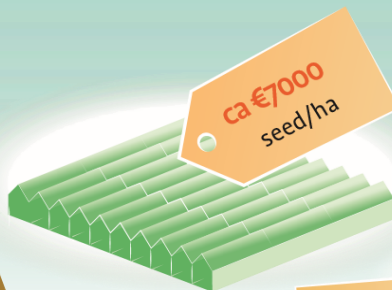


Added value tomato seeds

A nursery pays around **50,000 euros** for 1 kilo of tomato seeds. That is more than the price of 1 kilo of gold.

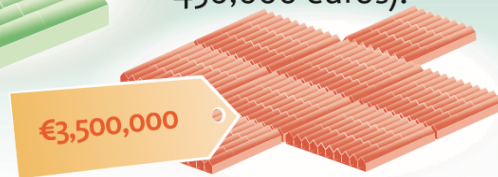


Using that 1 kilo of tomato seeds, the nursery can grow almost **8 hectares** of tomatoes in greenhouses.



Each hectare produces **600,000 kilos** of tomatoes, which will bring in around **450,000 euros** at sale.

So 1 kilo of seeds is worth **3.5 million euros** (7.8 hectares x 450,000 euros).



The retail value triples to **10 million euros**, or 200 times the seed value.



Source: Plantum
© Noordhoff Uitgevers



Relevance of PVP

(a) Breeders

- Diversity of breeders
- Number of breeders
- Investment in breeding

(b) Improved varieties

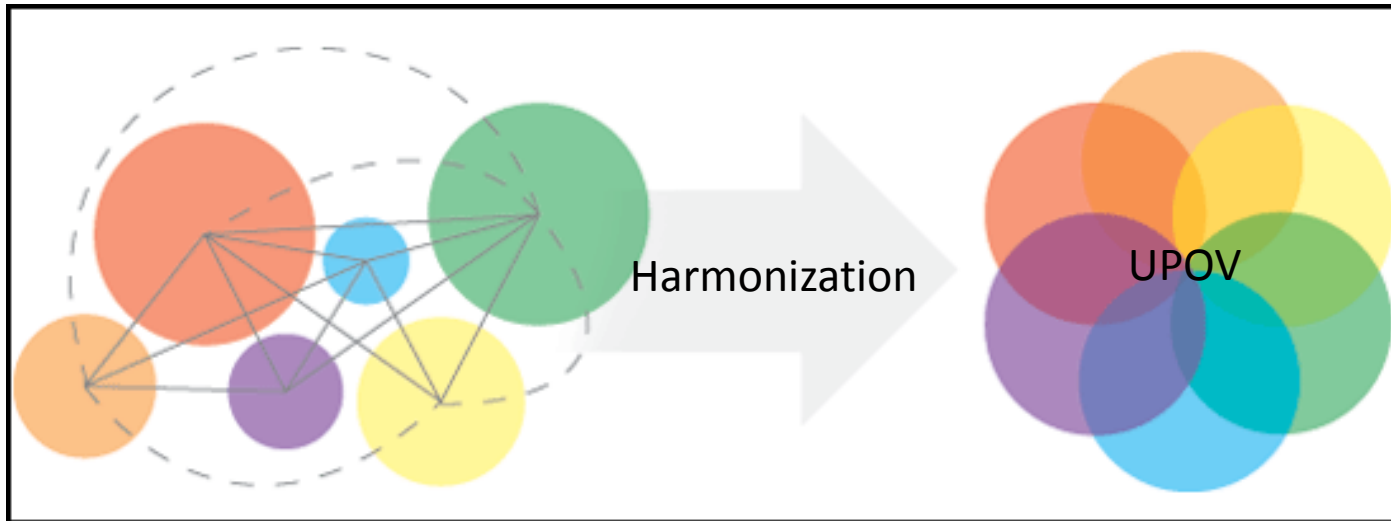
(c) Farmers, Growers, Consumers

- Delivering improved varieties to farmers/growers
- Delivering added value to consumers
- Income and Knowledge

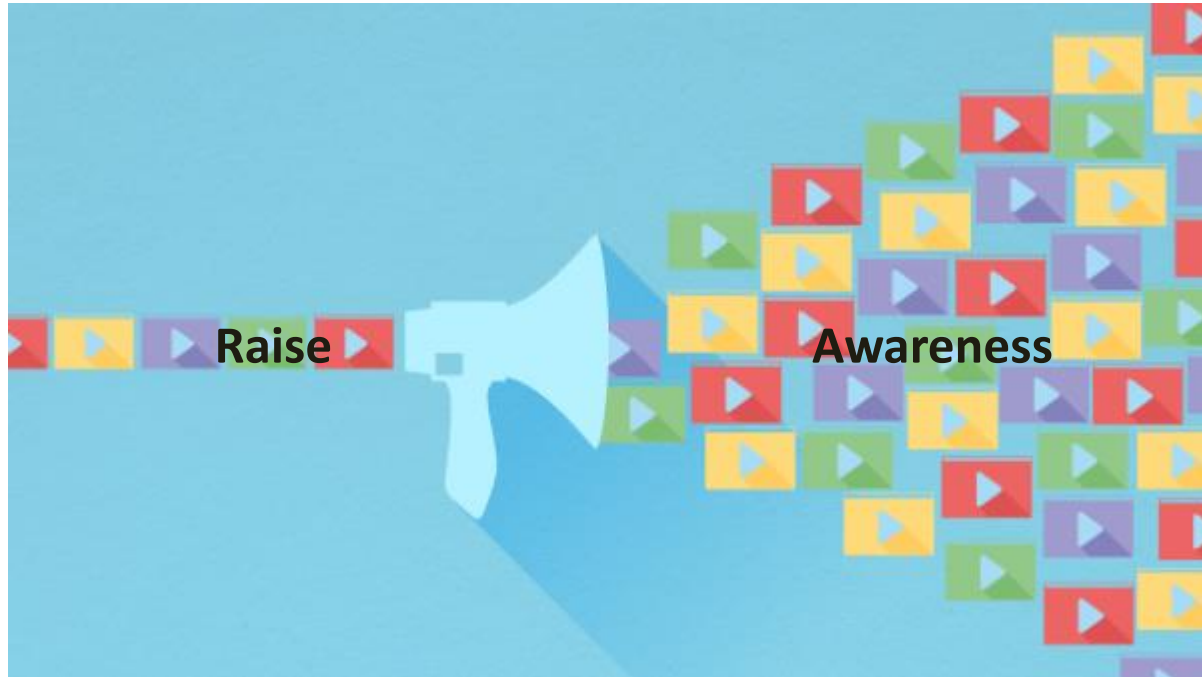
(d) International dimension

- Development of new industry on foreign markets
- Access to foreign varieties and enhanced domestic programs

The keystones of a strong PVP System...



The keystones of a strong PVP System...





Thank you for your attention!

Questions?



Quality in Horticulture