

Protection of Plant Inventions in the U.S. and Benefits

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Kitisri Sukhapinda
Attorney-Advisor
Office of Policy and International Affairs
USPTO

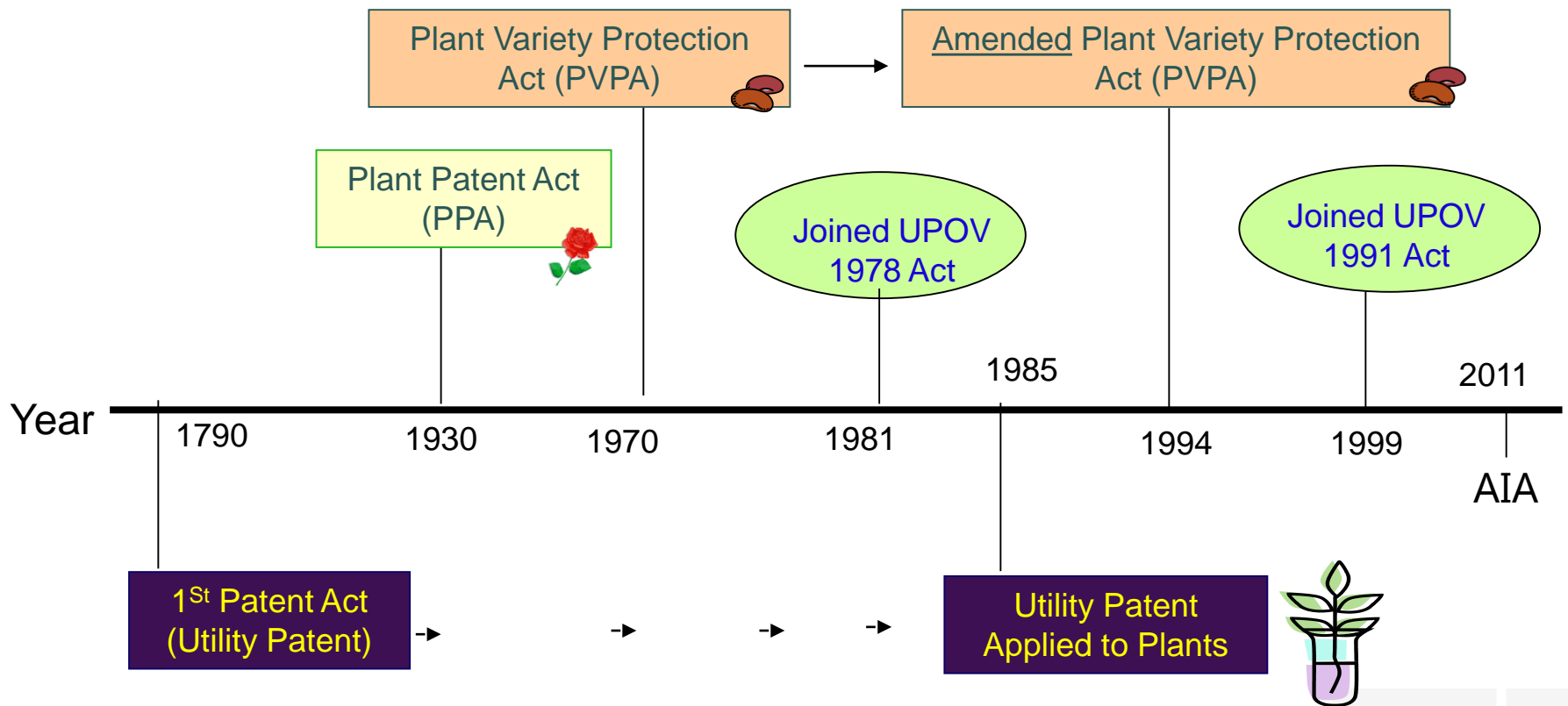
UNITED STATES
PATENT AND TRADEMARK OFFICE



Table of Contents

- **Types of IP Protection for Plants in the U.S.**
 - Plant Patents
 - Plant Variety Protection
 - Utility Patents
- **Statistics**
- **Benefits**

Long History of Plant Protection



uspto

Types of Intellectual Property Protection for Plants in the U.S.

Plant Patent Act

35 U.S.C. §§ 161-164

Utility Patent (to a Plant)

35 U.S.C. §§ 101 et seq. (102, 103, 112)

U.S. Patent and
Trademark Office

Plant Variety Protection Act

7 U.S.C. §§ 2321 et seq.

USDA

uspto

UPOV 1991 Act

Article 35

Reservations

(2) (a) ... any State which, at the time of becoming party to this Convention, is a party to the Act of 1978 and which, as far as varieties reproduced asexually are concerned, provides for protection by an industrial property title other than a breeder's right shall have the right to continue to do so without applying this Convention to those varieties.

PLANT PATENTS

Asexually Reproduced Plants



Plant Patent

- Plant Patent Act, 1930 (35 U.S.C. §§ 161-164)
- Basic Requirements:
 - Plant is new and distinct from other known varieties
 - Plant has been asexually propagated
 - If “discovered,” plant was found in a cultivated area
 - Description must be as full and complete as possible
 - Drawing or photograph
 - One claim

Plant Patent

Example:

Standard Claim Structure-

- A Petunia plant substantially as described and illustrated in the specification herein.



Plant Patents



PP22915 - Kniphofia
plant named 'Papaya
Popsicle'



PP22918 - Monarda
plant named 'Sugar
Lace'



PP23369 - Viola
plant named
'Blackout'



PP22858 - Apple
tree named 'NC1'



PP23375 - Raspberry
plant named 'Crimson
Giant'



PP23338 - Strawberry
plant named 'NABILA'

Plant Patent

- 20 year term from date of filing
- Right to **exclude** others from making, using, selling, offering for sale and importing the plant, or any of its parts
- Protects a single plant, **asexual** progeny, and any of its parts

Plant Patent

Examples of Patent Fees (as of November 1, 2015)

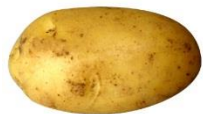
Description	Fee USD	Small Entity Fee USD	Micro Entity Fee USD
Basic filing fee - Plant	180	90	45
Plant Application Size Fee - for each additional 50 sheets that exceeds 100 sheets	400	200	100
Plant Search Fee	380	190	95
Plant Examination Fee	580	290	145
Plant issue fee	760	380	190

No maintenance fee



PLANT VARIETY PROTECTION

Sexually Reproduced Plants and Tubers





Plant Variety Protection Act (PVPA)

- Encourages the development of new varieties of sexually reproduced plants
- Provides protection to those who breed, or discover and develop them
- Applies to plants:
 - Sexually (seed) reproduced
 - Tuber propagated
 - F1 hybrids



Requirements for Plant Variety Protection under PVPA

A Variety must be:

- New (available less than 1 year in the US; less than 4 years in a foreign country)
- Clearly Distinct from all other varieties
- Uniform (all plants look alike)
- Stable (reproduces true to type)

*Applicant submits evidence for NDUS



U.S. PVP Key Features



- **Main Requirements**
 - New, distinct, uniform, stable
 - Plants must be sexually reproducible
 - Variety name required but not a registry
 - Deposit of propagation material
 - Seeds or in vitro samples (for potatoes)
 - Stored at the USDA National Center for Genetic Resources Preservation (NCGRP)
 - Available only with applicant's permission through PVPO
 - Publicly available after certificate expires



PVP Rights Granted

- Term: 20 years (25 years for trees or vines) from issuance of the certificate
- Rights to exclude others from
 - Selling or marketing
 - Conditioning or stocking
 - Offering for sale or reproducing
 - Importing or exporting
 - Using the variety to produce (as distinguished from develop) a hybrid or different variety



U.S. PVP Key Features



Fees:

- \$4,382 for filing & examination
- \$768 for issuance.
- \$5, 150 TOTAL
 - No maintenance fees.

UTILITY PATENTS

(Patents for Inventions)



Basic Patentability Standards

- Utility
- Novelty
- Non-obviousness
- Written Description
- Enablement
- Definiteness

Utility Patents to Plants

Possible to protect:

- Modified plant genes, proteins, products
- Transgenic plants
- Class of varieties with specific traits
- Plant variety
- Plant parts-cells, tissues, etc.
- Methods of producing or using plants/varieties
- Etc.

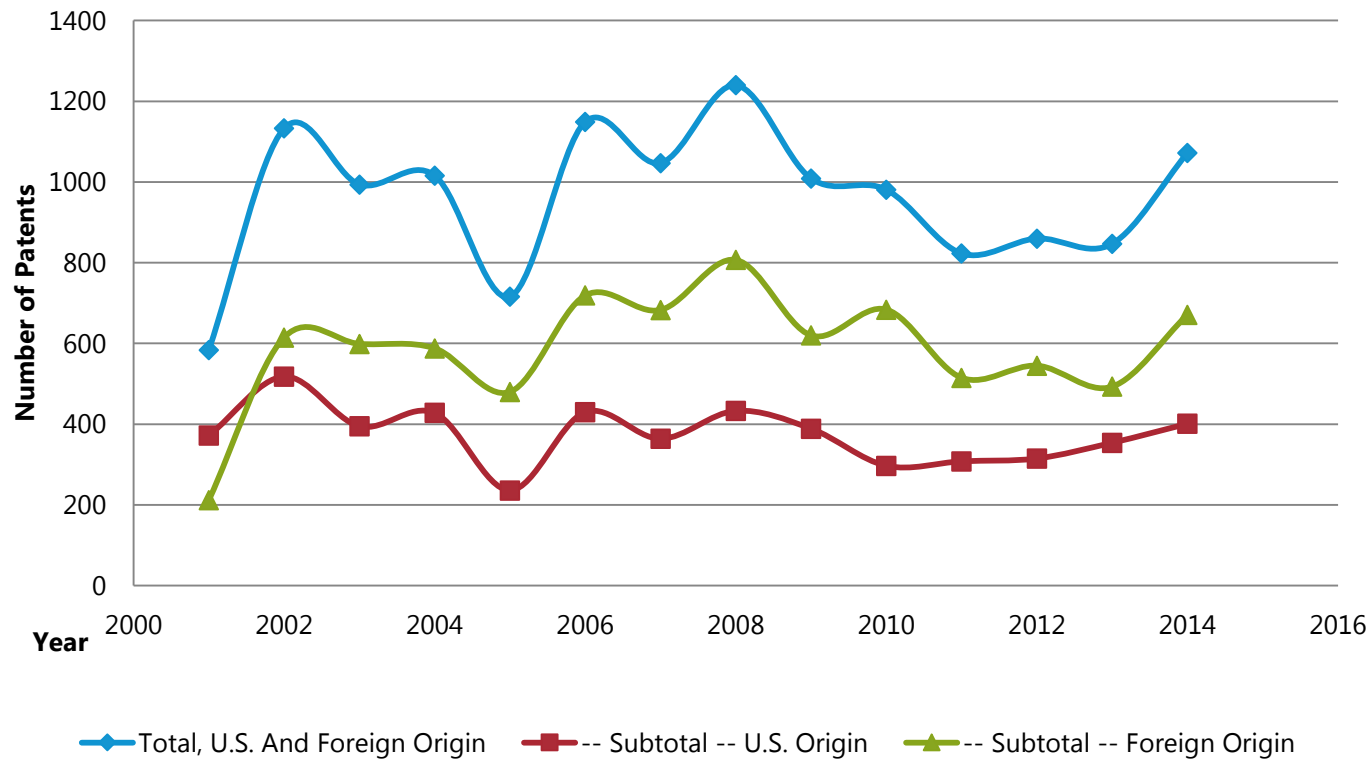
Utility Patents

- 20 years protection from date of filing
- Right to exclude others from making, using, selling, offering for sale, and importing the claimed invention
- Effective only within the United States, U.S. territories, and U.S. possessions
- Requires maintenance fees

STATISTICS

New Plant Varieties--Plant Patents

**Granted Plant Patents
2001-2014**



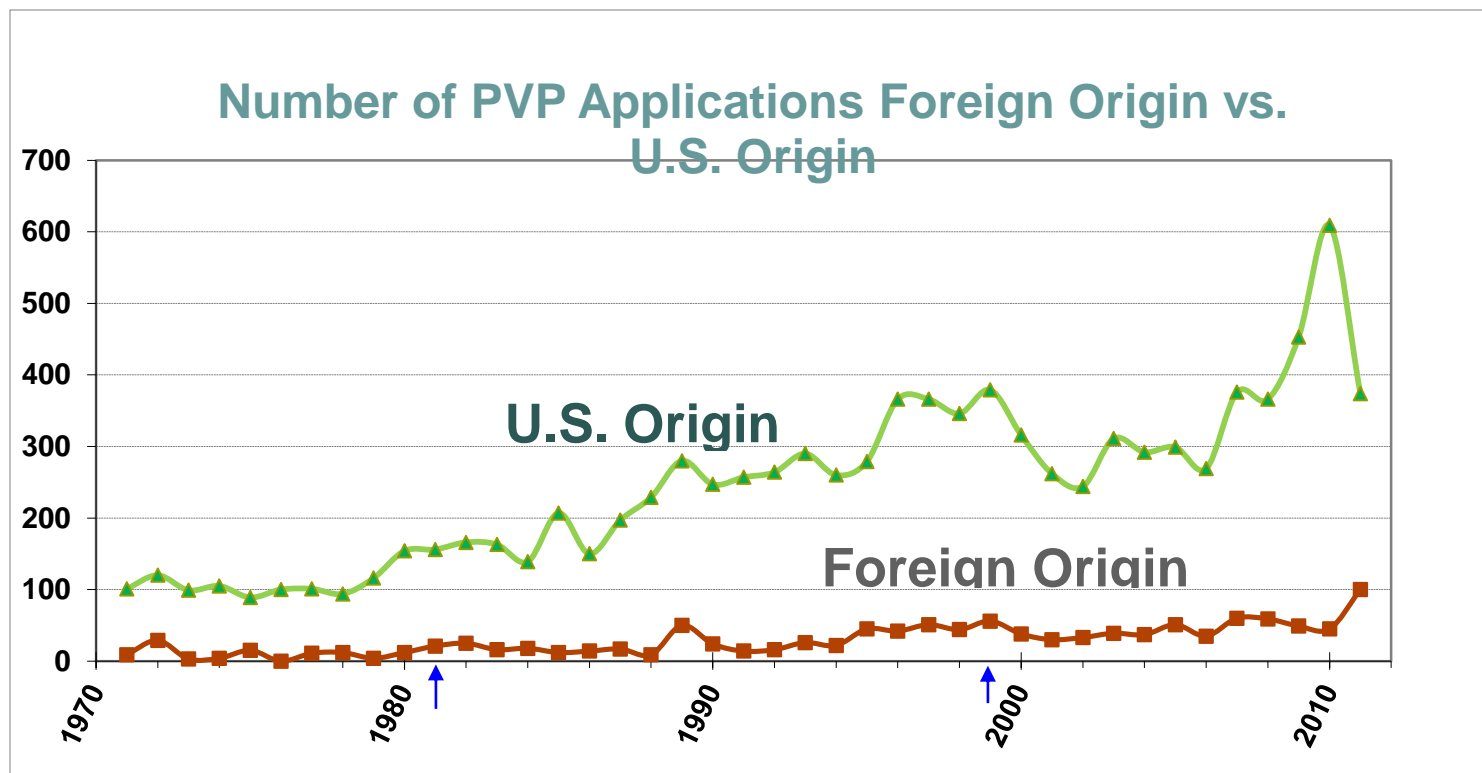
Granted Plant Patents

All years, up to 2014

Total 18,076

Top 3 Foreign Countries	
Netherlands	3,095
Germany	2,154
Japan	918
Examples of Asia Countries	
India	51
Thailand	38
Indonesia	26
Taiwan	18
Korea, South	11
China	9

New Plant Varieties-PVP Applications

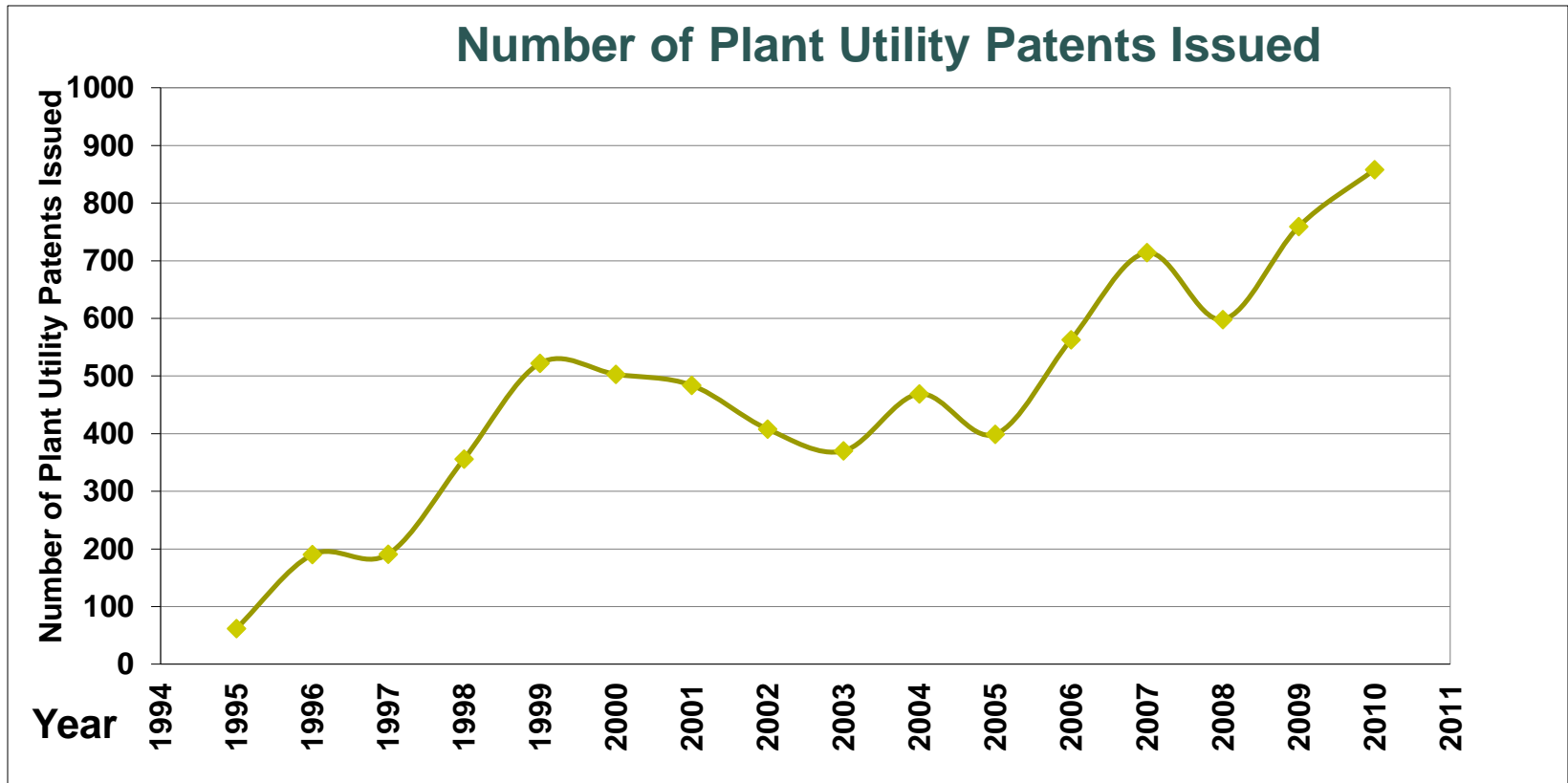


PVP Statistics

(since 1970)

Total Applications Received	13,203
Total Certificates Issued	10,711
Certificates in force	7,048
Total applications not issued (abandoned, withdrawn, denied)	1,751
Applications in Progress (include those 1) not examined, 2) recommended for PVP but not issued, or 3) somewhere in the examination process)	741

New Plant Varieties and Technologies- Utility Patents



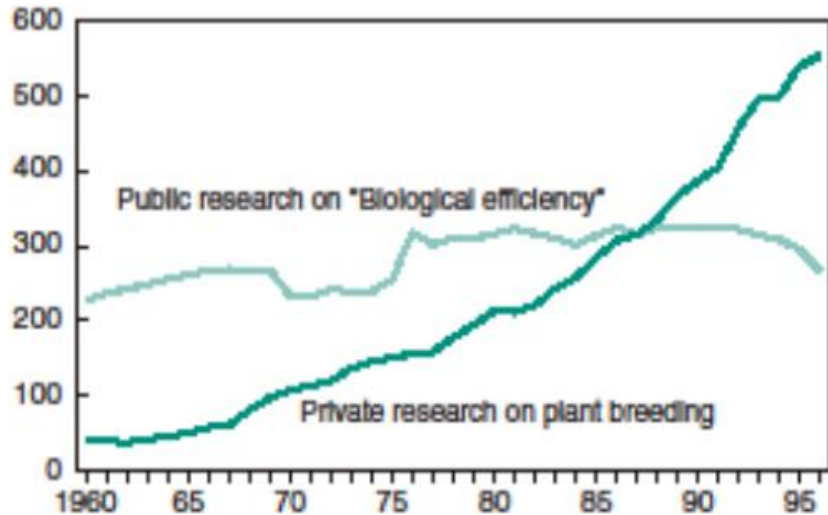
Benefits of Plant Variety Protection

- Incentivize investment in plant breeding and development of new varieties
- Increase numbers of new varieties of plants
- Improve genetics
- Benefit farmers and consumers

Private investment in plant breeding

Public and private research expenditures on plant breeding

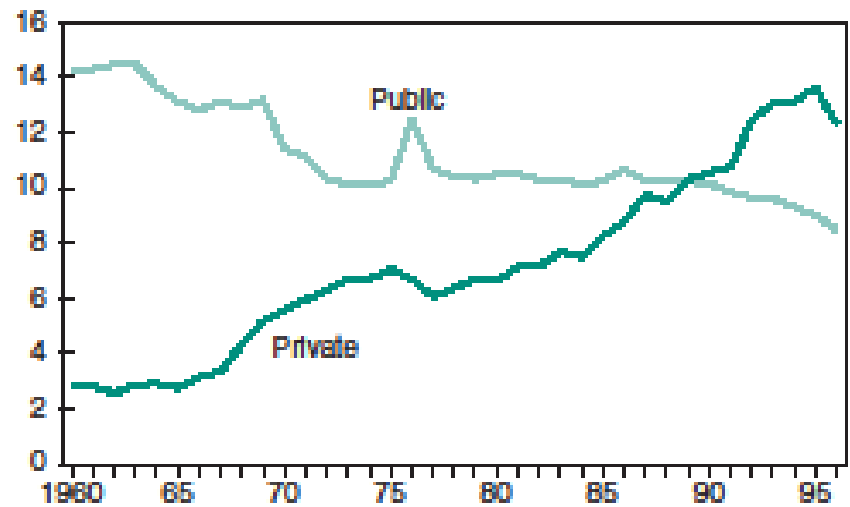
Million 1996 dollars



"Biological efficiency" Includes breeding and selection of improved plant varieties.

Plant breeding as a share of total agricultural R&D expenditures

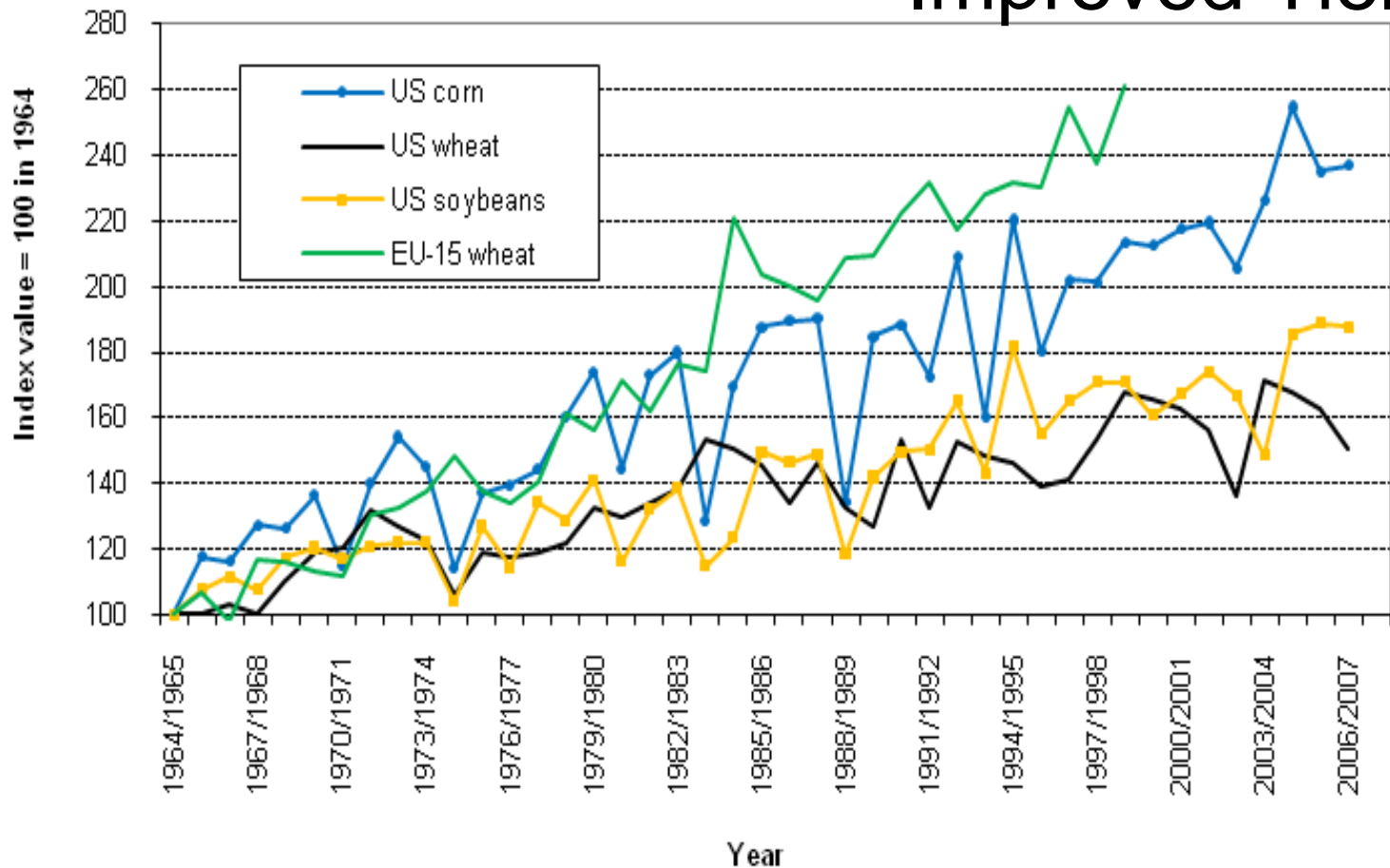
Percent



Improved Genetics

Rate of genetic gain is proportional to level of IP

Improved Yield



Dermot J. Hayes, Sergio H. Lence, and Susana Goggi
Iowa State University (AgBioForum, 12(2): 155-171. ©2009 AgBioForum)



Improved Genetics

- Herbicide tolerance (alfalfa, cotton, maize, etc.)
- Insect resistance (cotton, maize, tomato)
- Drought tolerance (maize)
- Delayed ripening (melon)
- Virus resistance (papaya, plum, squash)
- Modified amylase (potato)
- Modified fatty acid content (canola, maize, soybean)
- Altered amino acid content (maize)

Robust Seed Trade

Calendar year 2012

Estimated Value (Million USD)

Country	Field Crops		Vegetable Crops		Flower Seed	
	Import	Export	Import	Export	Import	Export
USA	873	930	369	529	70	72
Canada	133	317	75	3	15	72
Australia	57	84	53	24	3	31
Japan	98	33	113	91	20	21
Mexico	133	175	221	27	1	1
Chile	ND	218	ND	150	ND	20
Thailand	ND	7	ND	73	ND	ND

Robust Domestic Seed Market 2012

Country	Estimated Value
	(USD million)
USA	12,000
China	9,034
Japan	1550
Canada	550
Australia	400
Mexico	350

http://www.worldseed.org/isf/seed_statistics.html,
access Nov 30, 2015



Benefits of New Varieties of Plants

- Improve yield and crop productivity
- Provide alternative renewable energy
- Increase farmers' income
- Ensure food security
- Respond to climate change
- Improve health and nutrition
- Expand trade and economic growth
- More choices for consumers

Information Resources

<http://www.uspto.gov/web/offices/pac/plant/index.html>

<http://www.uspto.gov/web/offices/pac/utility/utility.htm>

<http://www.ams.usda.gov/PVPO>



