

# Update on Plant Related IP in the United States

Plant Variety Protection Seminar in Hangzhou, China  
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UNITED STATES  
PATENT AND TRADEMARK OFFICE



# TOPICS

- **Overview of Plant-related IP in the U.S.**
- **Statistics**
- **Examples of Recently Developed**

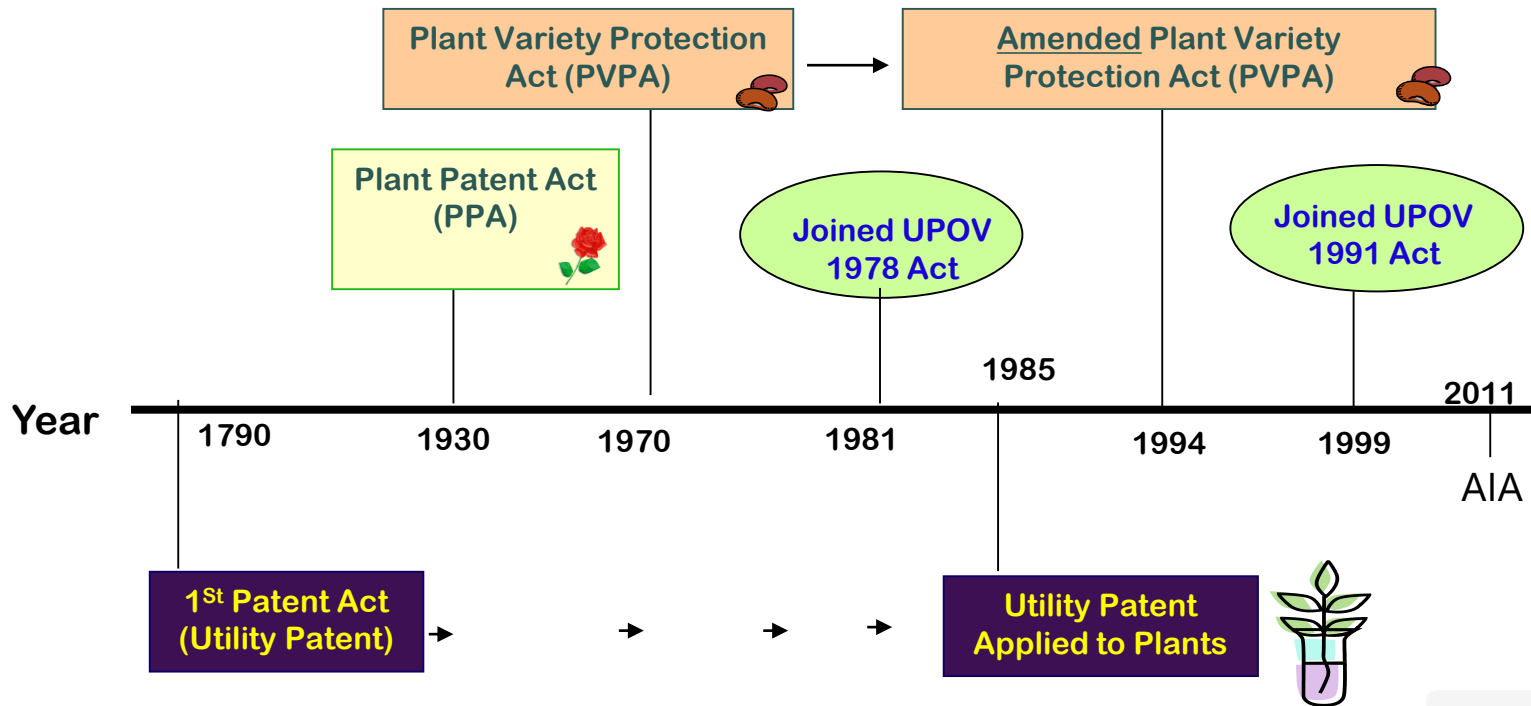
# IP Protection for Plants in the U.S.

## 1. Plant Variety Protection (PVP)

## 2. Plant Patents

Other types of IP protection for plants:  
Utility Patents, Trade Secret, Contract, Technological  
Protection (hybrids)

# Long History of Plant Protection



# IP Protection for Plants in U.S.

## U.S. Patent and Trademark Office (USPTO)

- **Utility Patent**
  - **All technologies**
- **Plant Patent (PPA)**
  - **Asexually reproduced plants**

## USDA-Plant Variety Protection Office (PVPO)

- **Plant Variety Protection Certificate (PVPA)**
  - **Seed reproduced varieties**
  - **Edible tubers**

# Plant Patents

## USPTO



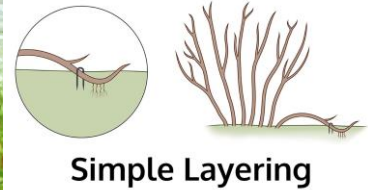
# Plant Patent

## Basic Requirements:

- Plant is **new** and **distinct** from other known varieties
- Plant has been **asexually propagated**
- Basic patentability standards:
  - Novelty
  - Utility
  - Non-obviousness
  - Written Description

# Plant Patent

- Asexually reproduced:
  - rooting, cuttings, grafting, budding, division, slips, layering, bulbs, rhizomes, runners, corms, tissue culture, etc.





# Examples of Plants Eligible for Plant Patents

- grape vine, apple tree, pear tree
- petunia plant, chrysanthemum plant, rose plant
- strawberry plant, pineapple plant
- algae and fungi (mushroom)

# 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 and asexual progeny**

# Plant Patent



PP22915 - Kniphofia  
plant named  
'Papaya Popsicle'



PP22918 - Monarda  
plant named 'Sugar  
Lace'



PP23369 - Viola  
plant named  
'Blackout'



PP22858 - Apple  
tree named 'NC1'

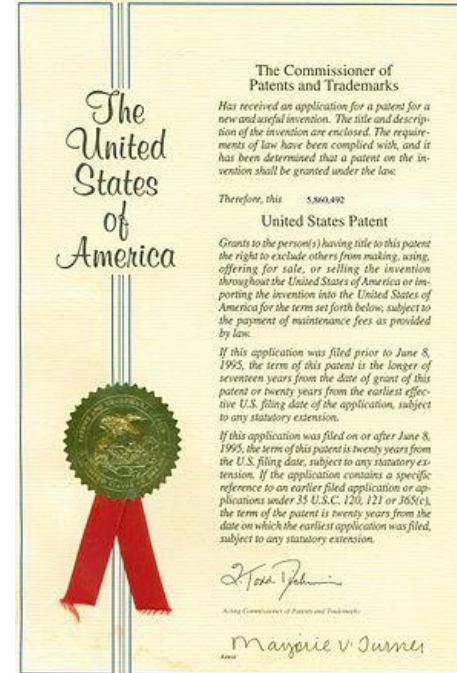


PP23375 - Raspberry  
plant named 'Crimson  
Giant'



PP23338 - Strawberry  
plant named 'NABILA'

# UTILITY PATENTS



# Basic Patentability Standards

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

# 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



# Utility Patents to Plants

- Possible to protect:
  - Modified plant genes, proteins, products
  - Transgenic plants phenotype (*i.e.*, observable characteristics)
  - Class of varieties with specific traits
  - Plant variety
  - Plant parts – cells, tissues, etc.
  - Methods of producing or using plants/varieties

# Utility Patents

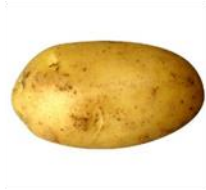
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# Plant Variety Protection (PVP)

## PVPO



# Plant Variety Protection (PVP)

- Encourages the development of new varieties of sexually reproduced plants
- Provides protection to those who breed, discover and develop the plant variety
- Requirements:
  - New
  - Distinct
  - Uniform
  - Stable

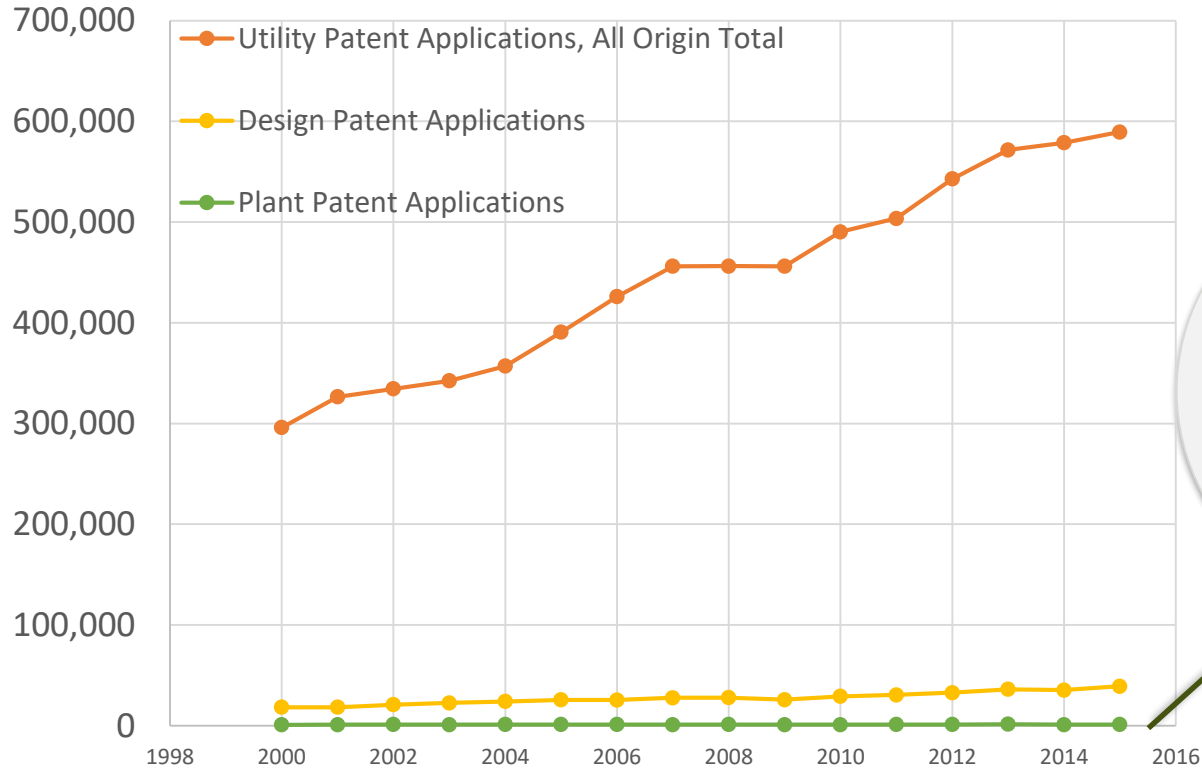
# Plant Variety Protection (PVP)

## Main Requirements

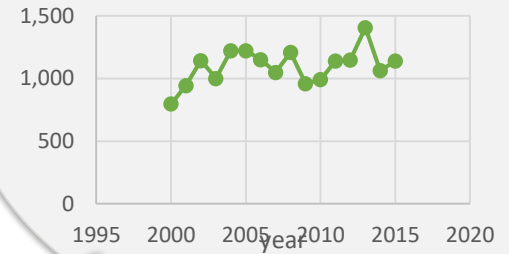
- **New, distinct, uniform, stable**
- Plants must be sexually reproducible
- Denomination
- Deposit of propagation material
  - Stored at the USDA National Center for Genetic Resources Preservation (NCGP)

# Statistics

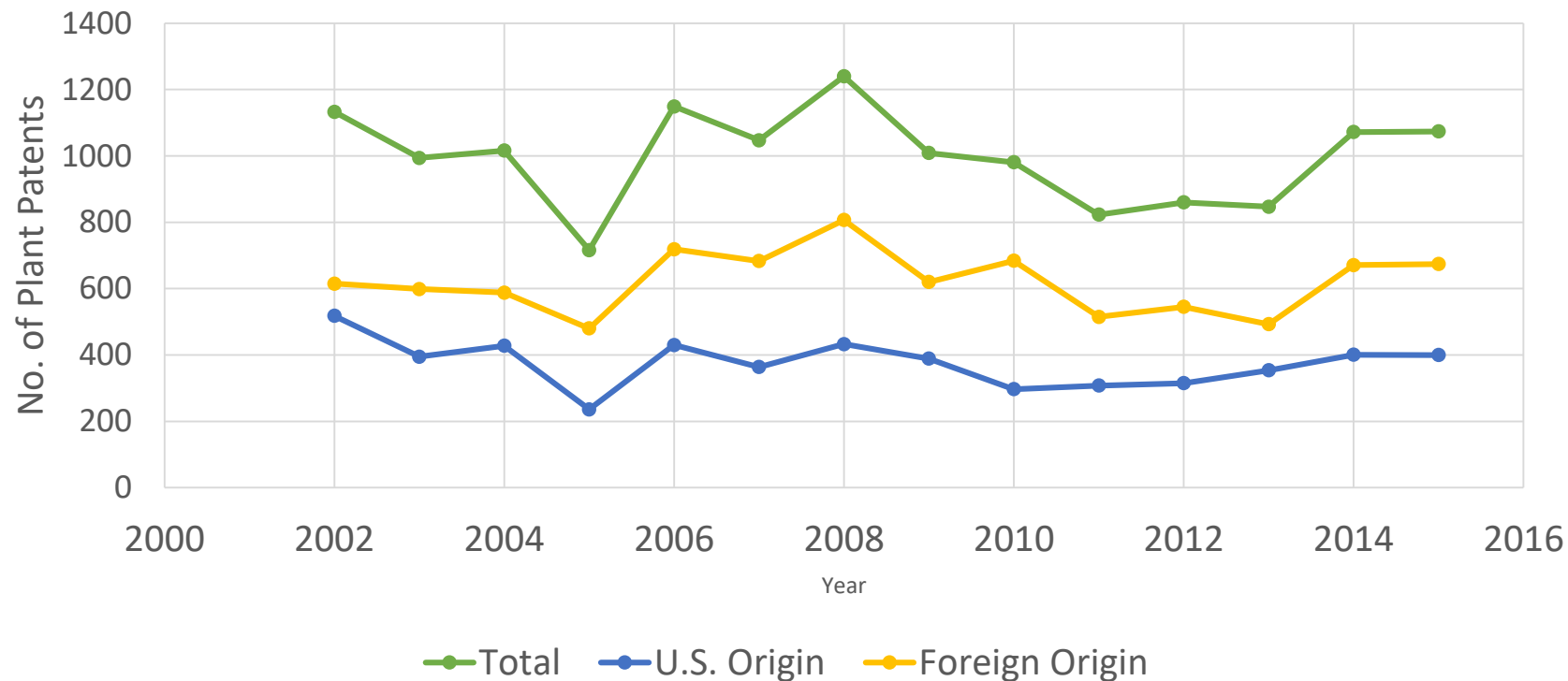
# No. of Patent Applications



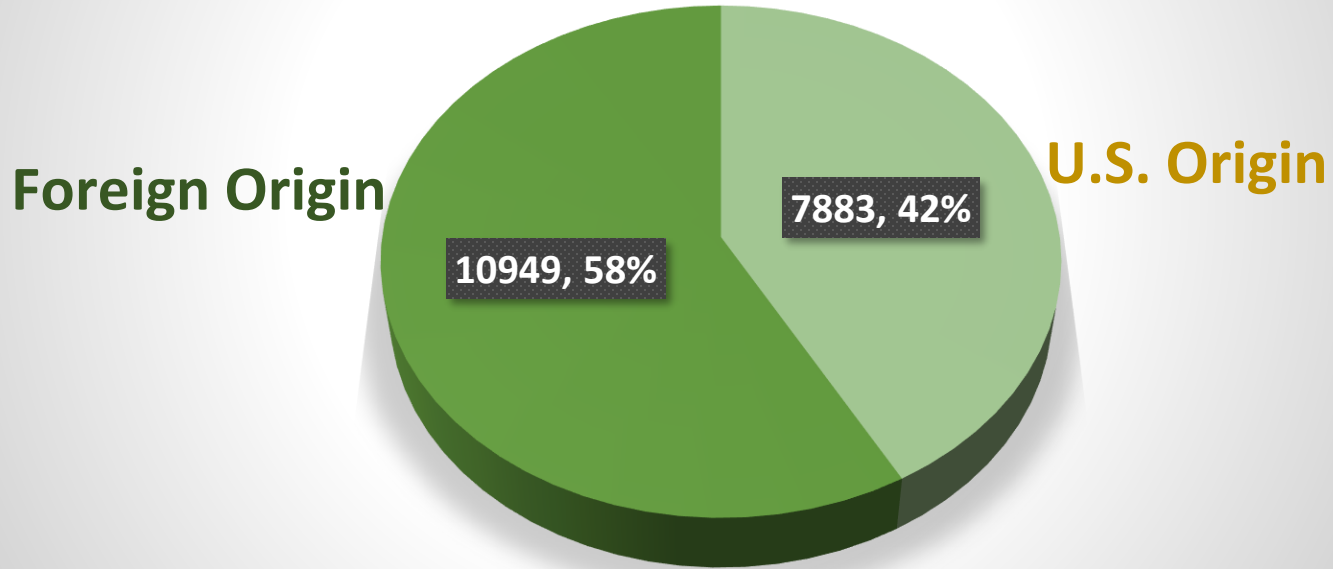
## No. of Plant Patent Applications



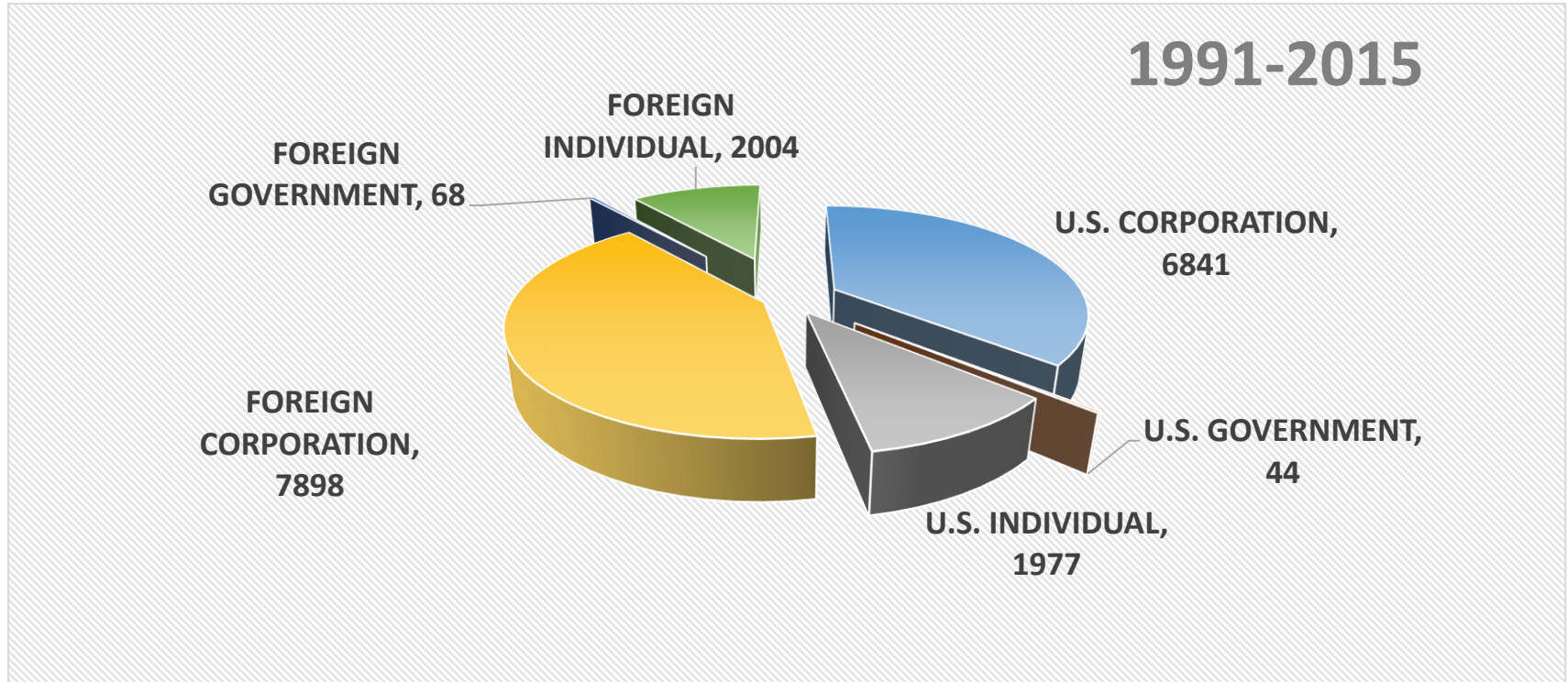
# Plant Patents Granted (by Year of Grant)



## Plant Patents Granted 1991-2015

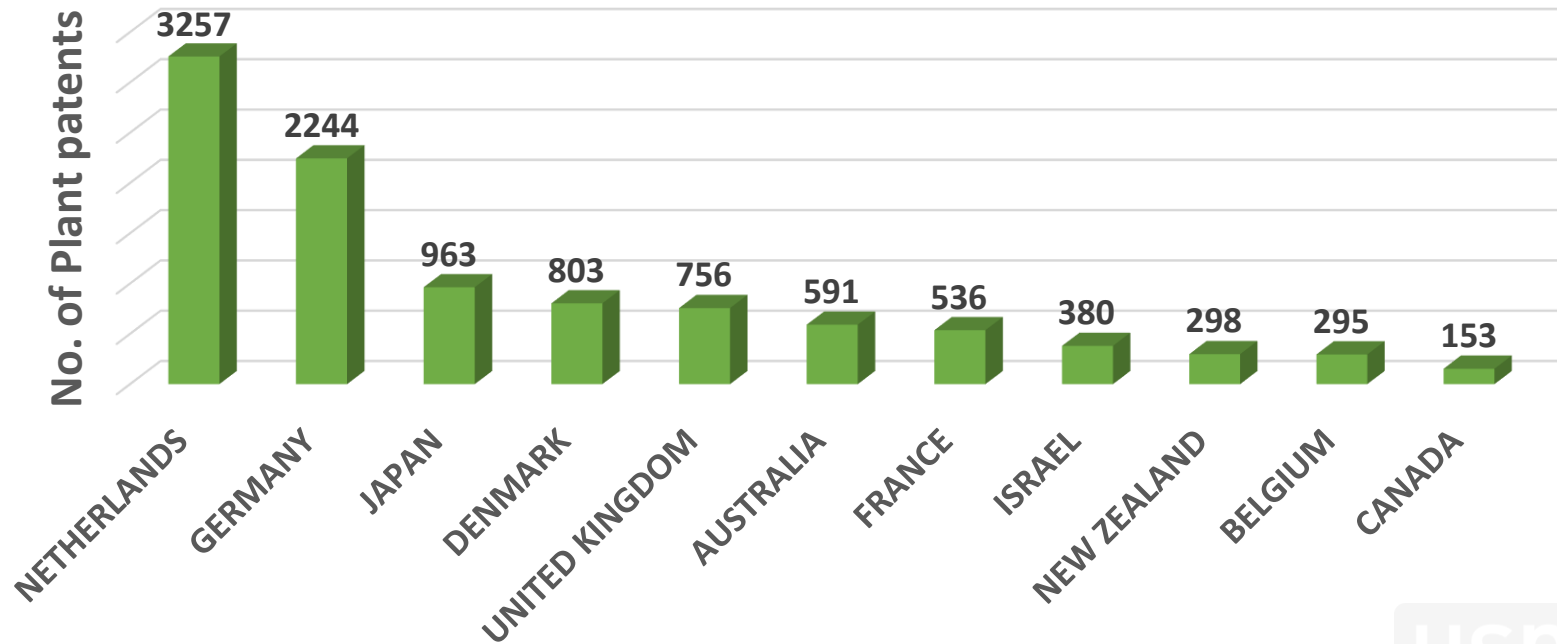


# No. of Plant Patents by Ownership Category





# Plant Patents Granted (Top 11 Foreign Countries)

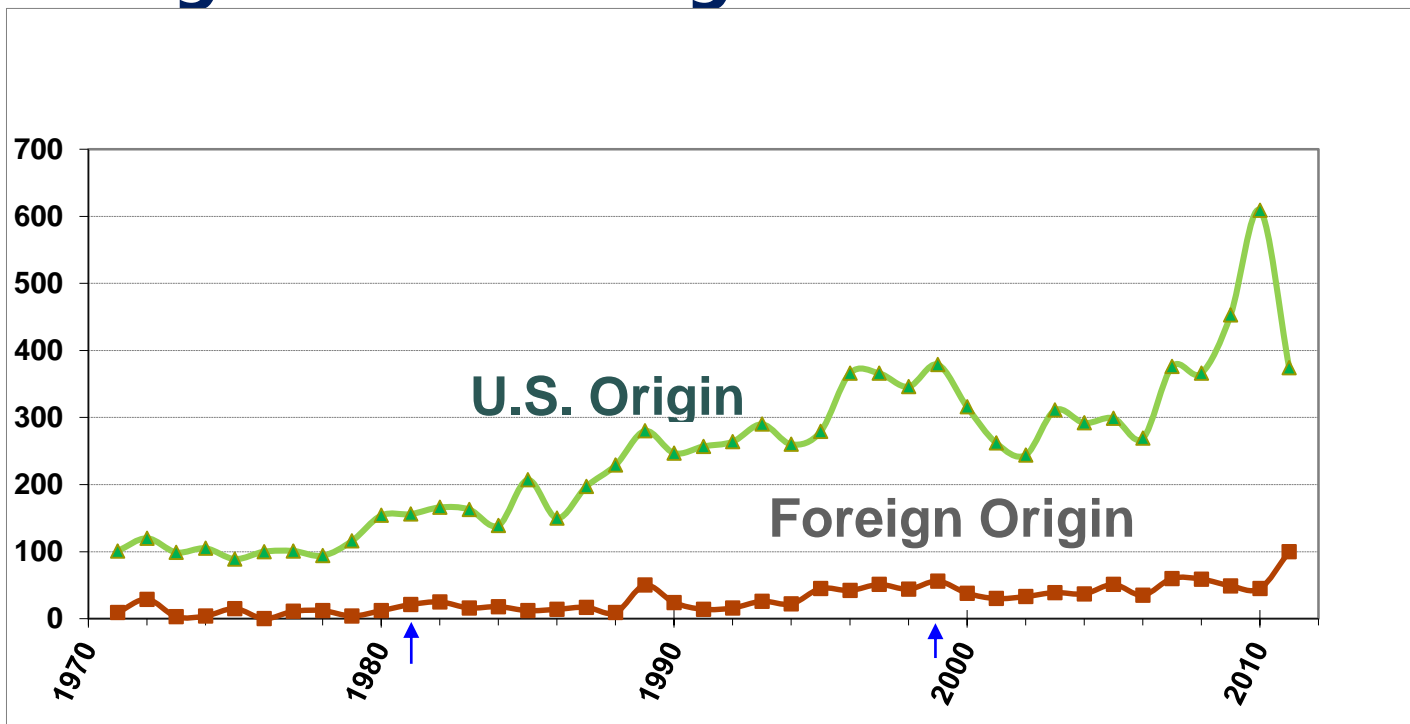


# Granted Plant Patents

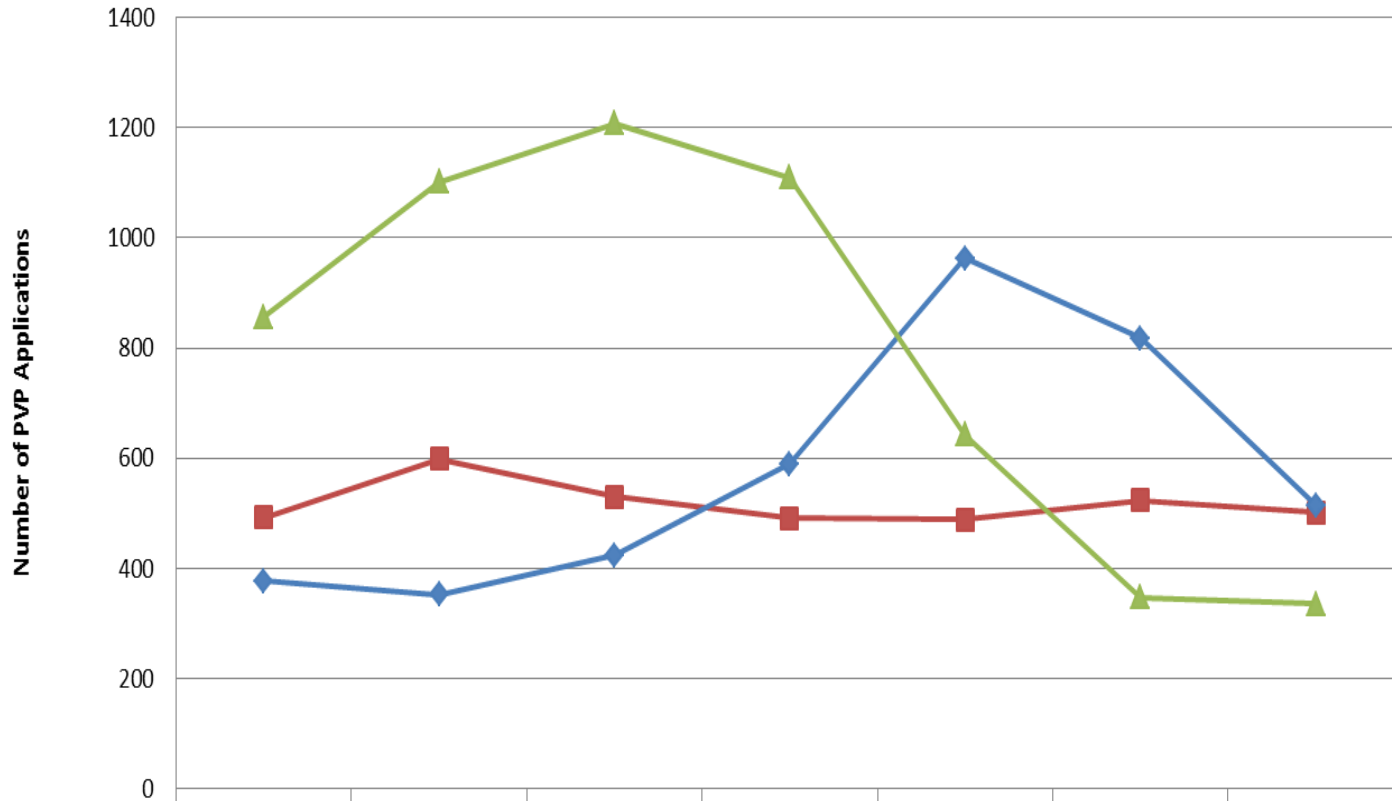
All years, up to 2015  
Total 18,832

Top 3 Foreign Countries	
Netherlands	3,257
Germany	2244
Japan	963
Examples of Asia Countries	
India	51
Thailand	45
Indonesia	26
Chinese Taipei	19
Korea, South	12
China	12

# Number of PVP Applications Foreign Origin vs. U.S. Origin



## PVP Application Incoming, Processing and Inventory by Fiscal Year

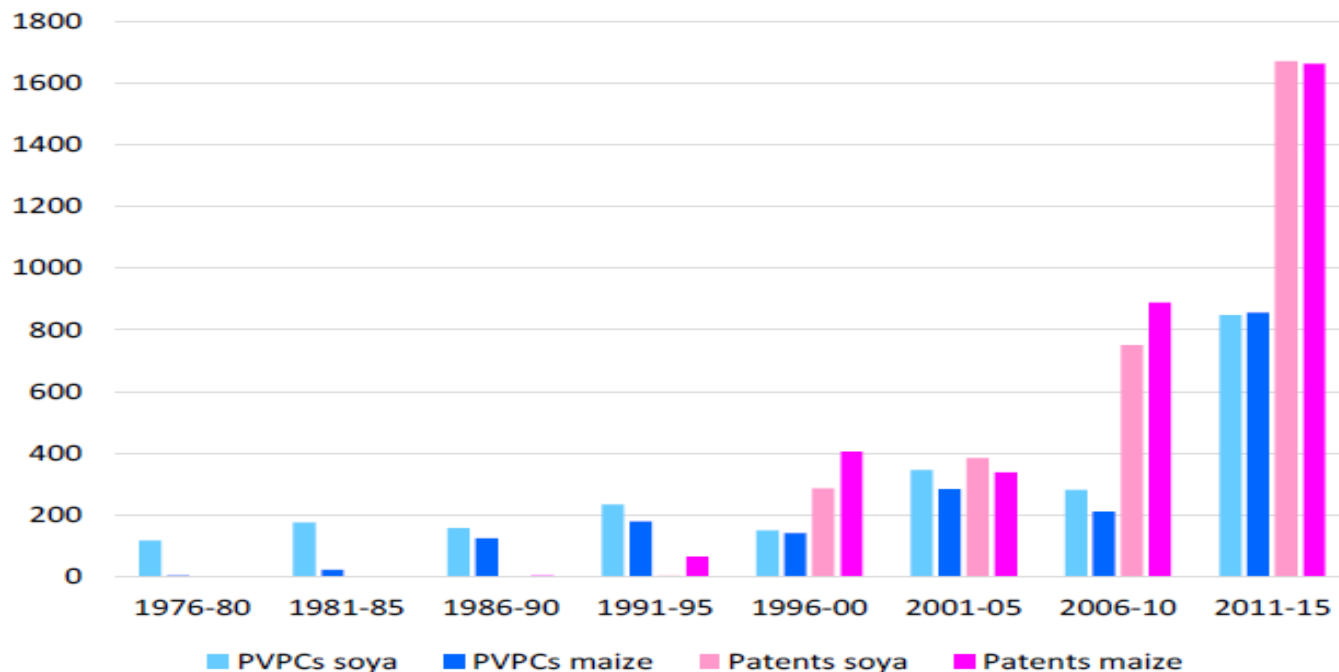


<span style="color: red;">■</span> Incoming	492	598	530	491	488	523	502
<span style="color: blue;">◆</span> Processed	377	352	424	590	963	818	514
<span style="color: green;">▲</span> Inventory	856	1102	1208	1109	642	347	335

# Overall PVP Statistics (1970-2015)

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

# Number of U.S. PVP Certificates and Utility Patents on Soybean and Maize Varieties, 1976-2015



Clancy, M.S., G. Moschini, Intellectual Property Rights and the Ascent of Proprietary Innovation in Agriculture, Working Paper 17-WP-572, January 2017.)

# Why New Plant Varieties?



World population of 9.1 billion people in 2050

Need 70 percent increase production between 2005/07 and 2050."

FAO: High –Level Expert Forum 2009-  
"Global agriculture toward 2050"

# Benefits to Farmers and Growers

## U.C. Davis-Strawberry –a success story

- Patents on more than 30 strawberry varieties
- A year round crop
- From 6 tons per acre in 1950 to 30 tons per acre today
- About 60% strawberry consumed worldwide are varieties developed by U.C. Davis
- License fees go back to research/innovation
- **Additional benefits to California growers:**
  - lower license fees—lower cost
  - get access to new varieties before others



### UPOV:

"We may allow propagation of patented UC strawberry varieties in other countries, if they provide and enforce Plant Breeders' Rights and other types of protection. Learn more about UPOV."

<http://research.ucdavis.edu/industry/ia/industry/strawberry/outside-info/>

uspto



# Benefits to Farmers and Growers

## Example:



### 'Elkton' Chipping Potato

- Resistance to Internal Heat Necrosis
- Suitable for chipping directly from field in southern locations
- Solely owned by USDA-ARS and protected by USDA Plant Variety Protection (PVP)
- Exclusively licensed to a for profit company
- **Pathogen- free stock for a small, but very important, segment of potato farmers**



# Benefits to Farmers and Growers

## Example:



### 'Sunpreme' Raisin Grape

- Dries on the vine naturally
  - Pruning easier than typical grapes
  - Raisins larger and fruitier in flavor
- 
- Solely owned by USDA-ARS and protected by USPTO Plant Patent.
  - Non-exclusively licensed to for profit companies.
  - **Farmers have a new commercial production protocol for raisins.**

# Benefits to Farmers and Growers

## Example:



### 'Black Pearl' Pepper

- Unique black foliage
  - Vigorous upright bushy grow habit
  - Round, black fruit maturing red with very hot flavor
- 
- Solely owned by USDA-ARS and protected by USDA Plant Variety Protection (PVP).
  - Exclusively licensed to a for profit company.
  - **Growers have a new type of ornamental plant market.**

**Thank you!**  
**elaine.wu@uspto.gov**

## RESOURCES

- <http://www.uspto.gov/web/offices/pac/plant/index.html>
- <http://www.uspto.gov/web/offices/pac/utility/utility.htm>
- <https://www.ams.usda.gov/PVPO>
- <https://www.ars.usda.gov/office-of-technology-transfer/>
- <http://www.upov.int/portal/index.html.en>