

# Benefits of the UPOV System of Plant Variety Protection for farmers and growers: U.S. Perspective

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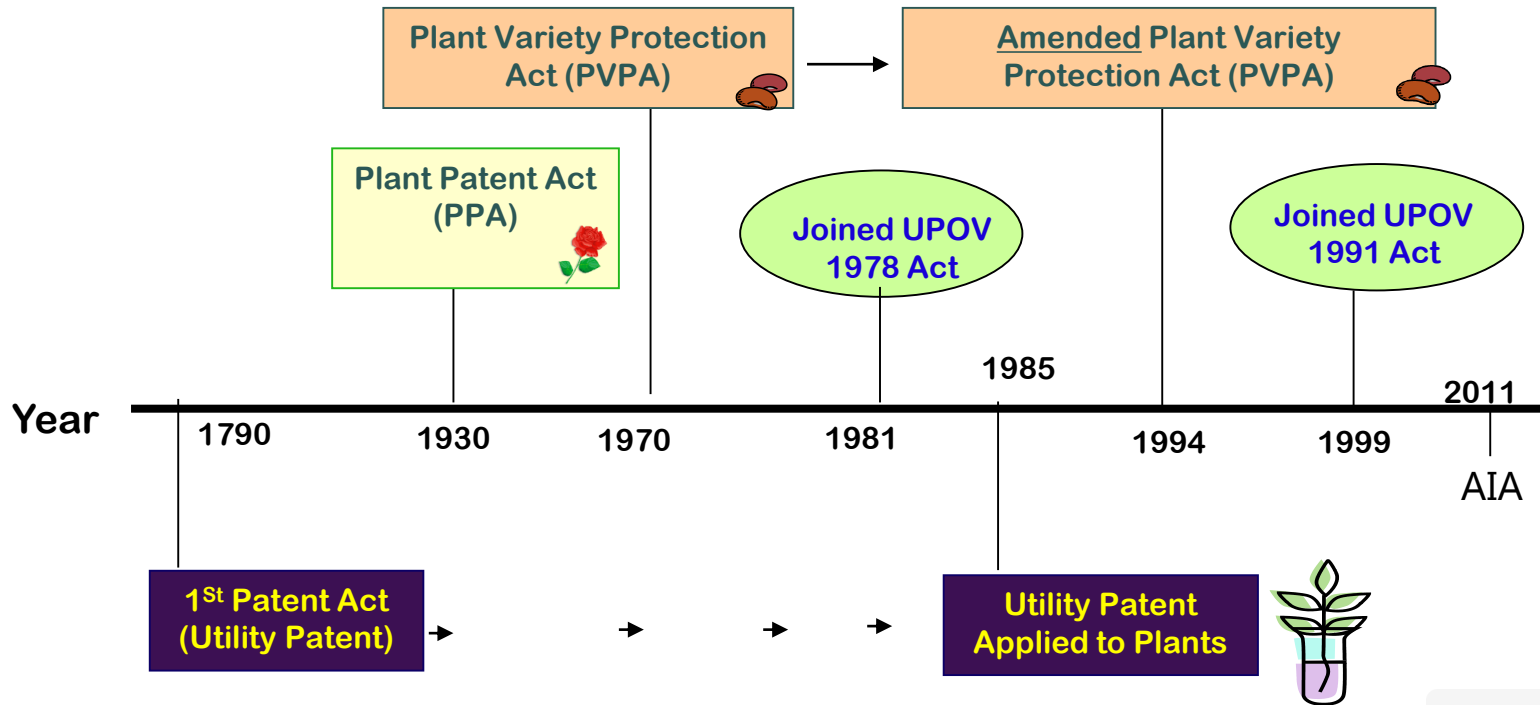
UNITED STATES  
PATENT AND TRADEMARK OFFICE



# TOPICS

- **U.S. Systems of Plant Intellectual Property Protection**
  - **Plant Patent**
  - **Plant Variety Protection**
  - **Statistics**
- **Benefits of effective PVP system under the UPOV Convention**
  - **Farmers/Growers**
    - **Examples**
  - **Consumers**
  - **Economy and Trade**

# Long History of Plant Protection



# IP Protection for Plants in the U.S. (UPOV Context)

## 1. Plant Variety Protection (PVP)

## 2. Plant Patents

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

# IP Protection for Plants in U.S.

U.S. Patent and Trademark Office  
(USPTO)

Plant Variety Protection Office  
(PVPO)

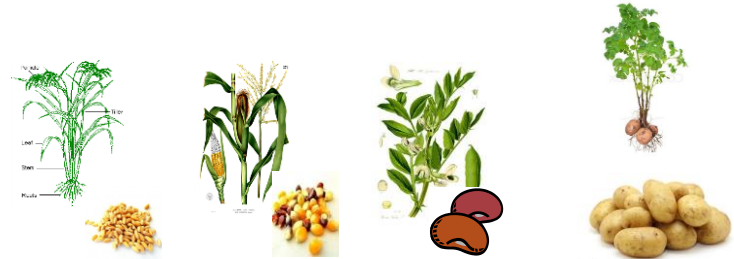
- **Plant Patent (PPA-1930)**

- **Asexually reproduced plants**



- **Plant Variety Protection (PVPA)**

- **Seed reproduced varieties**
- **Edible tubers**



UPOV  
Member

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# Plant Patents

## USPTO



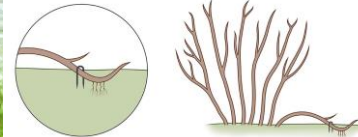
# Plant Patent

## 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
- Non obviousness
- Useful

# Plant Patent

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



Simple Layering



# 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'



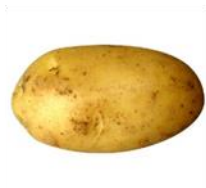
PP23375 - Raspberry  
plant named 'Crimson  
Giant'



PP23338 - Strawberry  
plant named 'NABILA'

# Plant Variety Protection (PVP)

## PVPO



# 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)

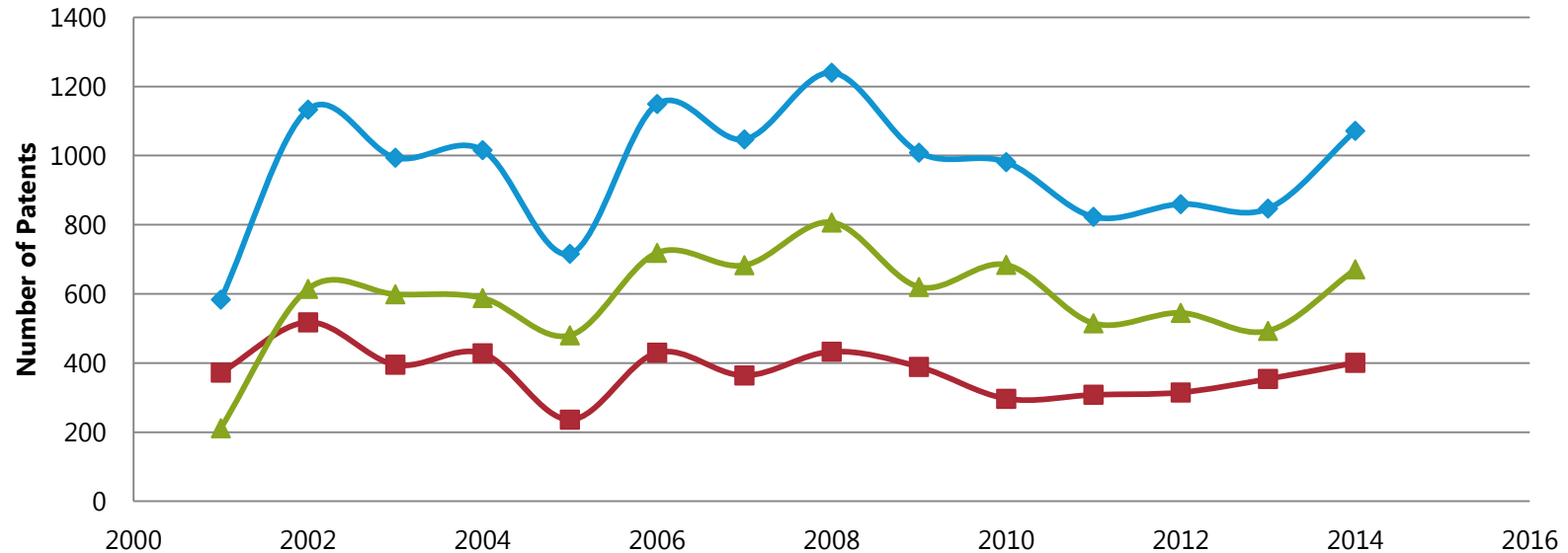
# PVP Rights Granted

- 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



# Statistics

# Numbers of Granted Plant Patents 2001-2014



Year

- ◆ Total, U.S. And Foreign Origin
- Subtotal -- U.S. Origin
- ▲ Subtotal -- Foreign Origin



# Granted Plant Patents

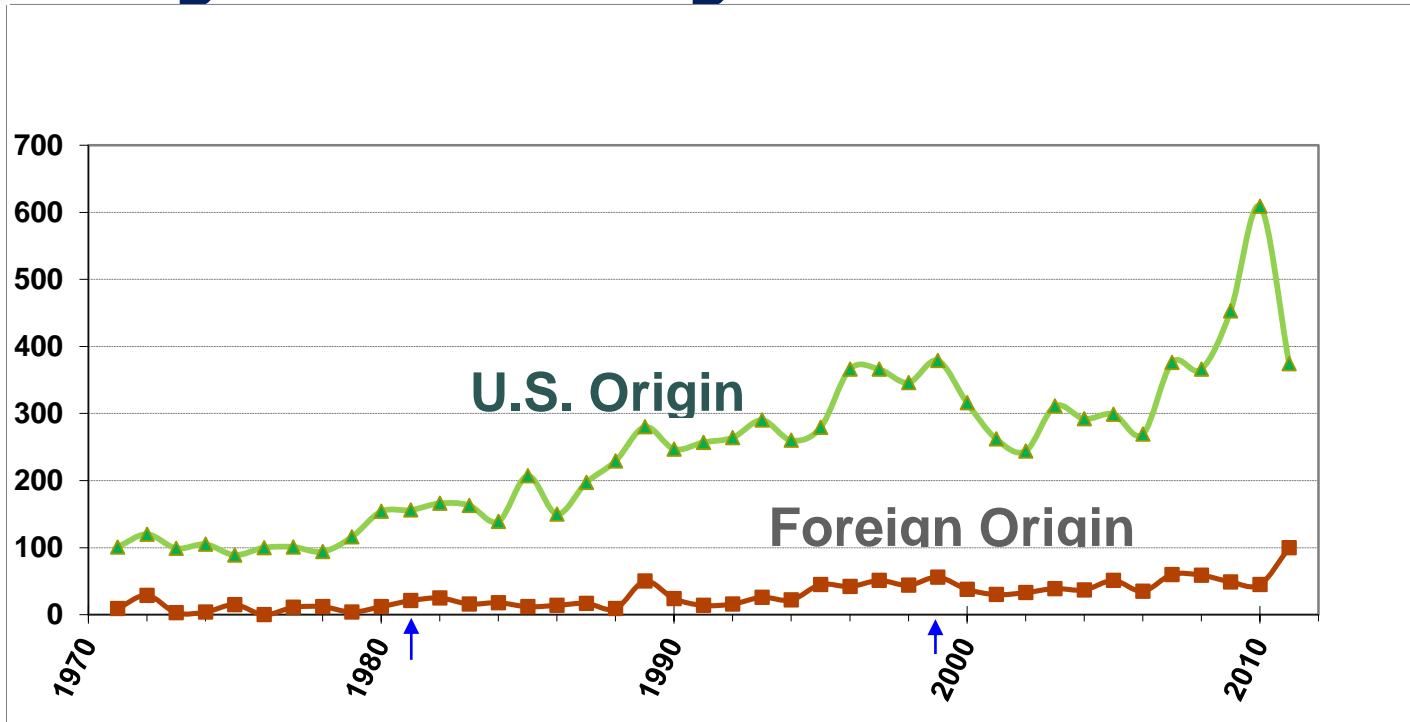
All years, up to 2015  
Total 18,832

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





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



## Overall PVP Statistics (since 1970)

|  |               |
|--|---------------|
| <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<br/>(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>    |

# **Benefits of effective PVP system under the UPOV Convention**

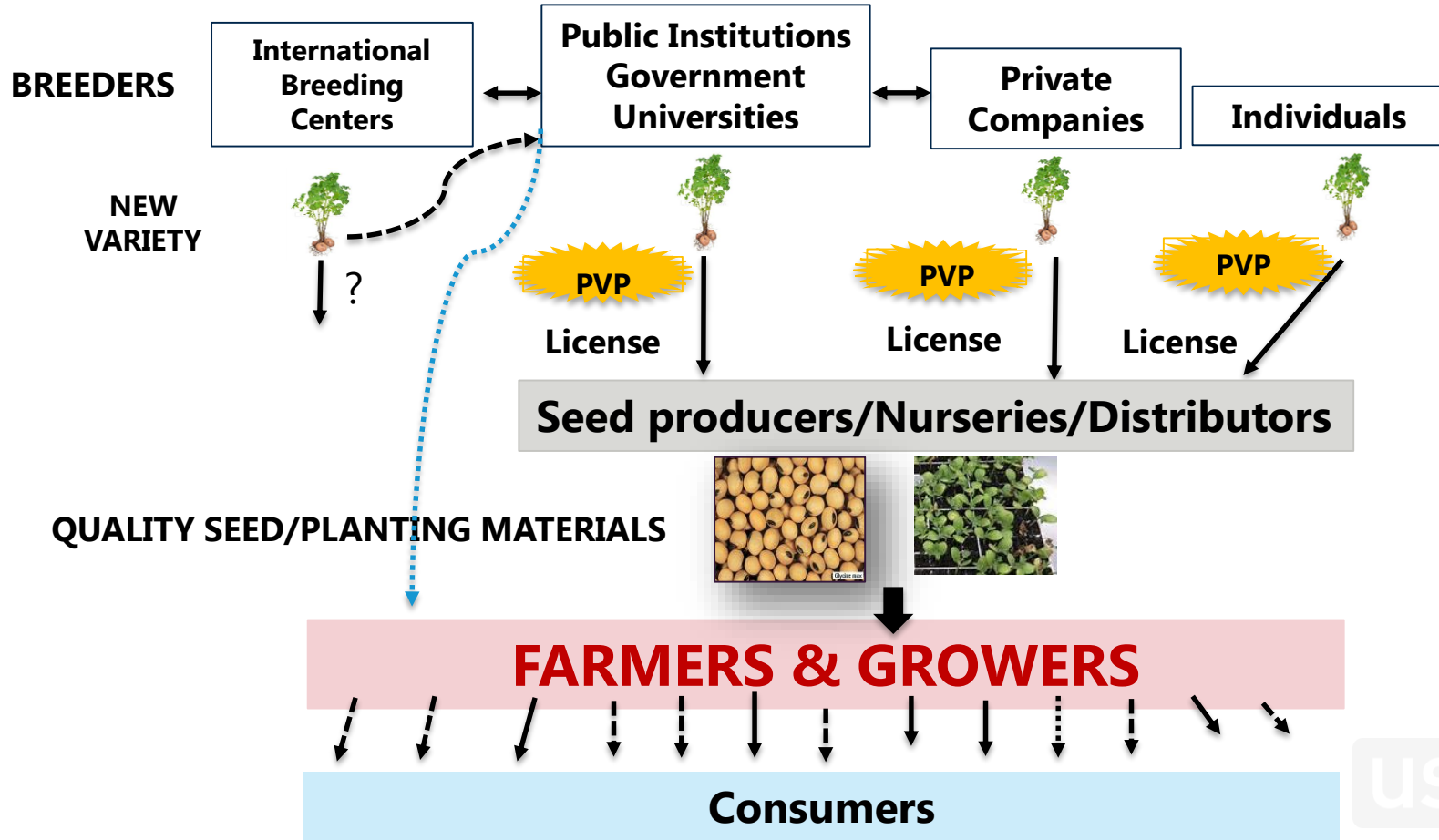
# Why New Plant Varieties?

- Food security
- Adverse environment conditions
- Quality foods
- Renewable energy-bio fuels
- Storage, transport, distribution concerns
- Consumers' needs-fruit, vegetables, ornamentals
- Job creation, Trade, and economic growth

# Benefits of Effective PVP System under the UPOV Convention

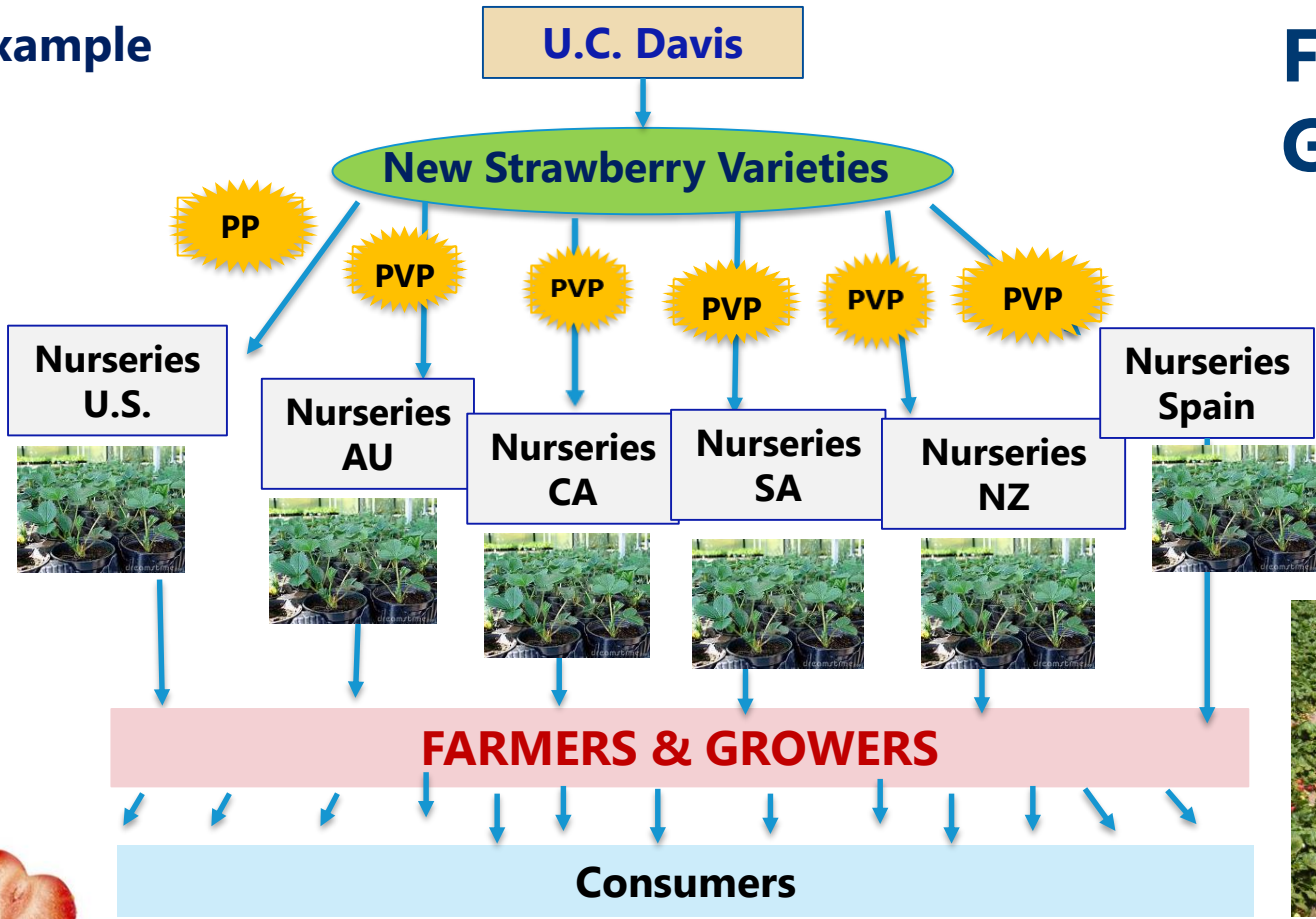
- Incentivize investment in plant breeding and new variety development
- Encourage sharing of information and genetic materials
- Encourage private sector participation and public-private cooperation
- Increase numbers of new/improved varieties
- Provide access to quality seed/planting materials to farmers
- Promote businesses and trade

# Benefits to Farmers and Growers



# Benefits to Farmers and Growers

Example





# 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.**

# Benefits to Farmers and Growers

- Access to new varieties →
- Access to quality seed/propagating materials
  - germination rate, seedling vigor, uniformity, disease-free
- Increase yield/reduce risk of crop loss
  - increase income

# Benefits to Farmers and Growers

## ➔ Access to new varieties :

- **Reduce uses of pesticides/herbicides**
  - Herbicide tolerance (alfalfa, cotton, maize, etc.)
  - Insect resistance (cotton, maize, tomato)
- **Reduce use of water/ make use on marginal land**
  - Drought tolerance (maize)
- **Reduce harvest loss**
  - Virus resistance (papaya, plum, squash)
- **Increase market advantage**
  - Delayed ripening (melon)
  - Unique products (personal-sized water melon)



# Benefits to Consumers

- **Improved nutritional values:**
  - high carotene carrots,
  - high lutein spinach and tomatoes,
- **Attractive to consumers of all ages:**
  - Sweet lettuces, mild sweet onions, multi-colored carrot
  - sticks, snack sized seedless cucumbers
  - kale without bitterness
  - sweet grape tomatoes
  - seedless watermelon
- **Convenience to consumers:**
  - baby cut and peeled carrots,
  - personal sized watermelons, and ready to eat babyleaf spinach



# Benefits: Robust Domestic Seed Market

| Country   | Estimated Value (2012) |
|-----------|------------------------|
|           | (USD million)          |
| USA       | 12,000                 |
| China     | 9,034                  |
| Japan     | 1550                   |
| Canada    | 550                    |
| Australia | 400                    |
| Mexico    | 350                    |

[http://www.worldseed.org/isf/seed\\_statistics.html](http://www.worldseed.org/isf/seed_statistics.html),  
access Nov 30, 2015



# Benefits: Robust Seed Trade

Estimated Value (Million USD) Calendar year 2012

| 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     |



# 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"

# The UPOV – Effective PVP System Benefits Farmers and Growers.

- <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>
- <https://www.ars.usda.gov/office-of-technology-transfer/>
- <http://www.upov.int/portal/index.html.en>