Why New Plant Varieties?

“feeding a world population of 9.1 billion people in 2050 would require raising overall food production by some 70 percent between 2005/07 and 2050.”

FAO: High –Level Expert Forum 2009—“Global agriculture toward 2050”
Why New Plant Varieties?

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

Why IP Protection for New Plant Varieties?

- Incentivize investment in plant breeding and new variety development
- Encourage private sector participation and public-private cooperation
- Increase numbers of new/improved varieties
- Provide access to quality seeds/planting materials to farmers
- Encourage sharing of information and genetic materials
- Promote businesses and trade
Intellectual Property Protection for Plants in the U.S.

1. Plant Variety Protection
2. Plant Patents
3. Utility Patents

Trade Secret, Contract, Technological protection (hybrids)

Long History of Plant Protection

- 1930: 1930
- 1970: 1970
- 1985: Joined UPOV 1978 Act
- 1994: Amended Plant Variety Protection Act (PVPA)
- 1999: Joined UPOV 1991 Act
- 2011: America Invents Act
## IP Protection for Plants in U.S.

<table>
<thead>
<tr>
<th>U.S. Patent and Trademark Office (USPTO)</th>
<th>Plant Variety Protection Office (PVPO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Plant Patent (PPA-1930)</strong></td>
<td>• <strong>Plant Variety Protection (PVPA)</strong></td>
</tr>
<tr>
<td>➢ Asexually reproduced plants</td>
<td>• Seed reproduced varieties</td>
</tr>
<tr>
<td>• <strong>Utility Patent</strong></td>
<td>• Edible tubers</td>
</tr>
<tr>
<td>➢ All technologies</td>
<td></td>
</tr>
</tbody>
</table>

### Plant Variety Protection Act (PVPA)

- Plant Variety Protection Office (PVPO), U.S. Department of Agriculture
- Encourages 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
To Be Eligible for PVP a Variety Must Be:

- **New** (sold for less than 1 year in the US or less than 4 years in a foreign country)
- clearly **Distinct** from all other varieties
- **Uniform** (all plants look alike)
- **Stable** (reproduces true to type)
- **Variety Name**

Other Requirements

- **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.
Other Requirements

FEES

- $5,150 TOTAL
  - $4,382 for filing & examination
  - $768 for issuance

- No maintenance fees.

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
- Rights extended to
  - Plant parts (flowers and fruit) are protected
  - Essentially derived plants are protected
### PVPO Databases — Feb. 2013

<table>
<thead>
<tr>
<th>PVPO Species Databases</th>
<th>Number of Records (Varieties)</th>
<th>PVPO Species Databases</th>
<th>Number of Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>1,530</td>
<td>Pea</td>
<td>2759</td>
</tr>
<tr>
<td>Barley</td>
<td>3214</td>
<td>Pepper</td>
<td>1398</td>
</tr>
<tr>
<td>Bean</td>
<td>2784 (Garden bean), 1585 (Dry bean)</td>
<td>Potato</td>
<td>737</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>1,086</td>
<td>Rapeseed</td>
<td>1772</td>
</tr>
<tr>
<td>Corn</td>
<td>3585</td>
<td>Rice</td>
<td>712</td>
</tr>
<tr>
<td>Cotton</td>
<td>2803</td>
<td>Ryegrass</td>
<td>2548</td>
</tr>
<tr>
<td>Fescue</td>
<td>732 (Fine fescue), 983 (tall fescue)</td>
<td>Sorghum</td>
<td>3423</td>
</tr>
<tr>
<td>Lettuce</td>
<td>2682</td>
<td>Soybean</td>
<td>4289</td>
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<tr>
<td>Melon</td>
<td>745</td>
<td>Tomato</td>
<td>3195</td>
</tr>
<tr>
<td>Oat</td>
<td>1339</td>
<td>Watermelon</td>
<td>971</td>
</tr>
<tr>
<td>Onion</td>
<td>1721</td>
<td>Wheat</td>
<td>4411</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Recording</th>
<th>Processed</th>
<th>Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>592</td>
<td>397</td>
<td>405</td>
</tr>
<tr>
<td>2010</td>
<td>598</td>
<td>392</td>
<td>408</td>
</tr>
<tr>
<td>2011</td>
<td>530</td>
<td>404</td>
<td>488</td>
</tr>
<tr>
<td>2012</td>
<td>481</td>
<td>486</td>
<td>523</td>
</tr>
<tr>
<td>2013</td>
<td>486</td>
<td>503</td>
<td>502</td>
</tr>
<tr>
<td>2014</td>
<td>488</td>
<td>502</td>
<td>501</td>
</tr>
<tr>
<td>2015</td>
<td>510</td>
<td>501</td>
<td>500</td>
</tr>
</tbody>
</table>
New Plant Varieties

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

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
Basic Patentability Requirements

- Patent eligible subject matter: Process, Machine, Manufacture, or Composition of Matter
  - Judicial Exceptions (patent ineligible): Laws of nature, physical phenomena and abstract ideas
- Claims must be novel and non-obvious to one of ordinary skill the art
- There must be sufficient written description
- Claims must be enabled
- Claims language must be definite
Plant Patent

- Requirements: plant is new, distinct, asexually reproduced + basic patentability standards
  - Utility
  - Non-obviousness
  - Written Description (relaxed)
  - Variety denomination

Asexually reproduced:

rooting, cuttings, grafting, budding, division, slips, layering, bulbs, rhizomes, runners, corms, tissue culture, etc.
Plant Patent

- One claim
- Representative of claim: “A petunia plant substantially as described and illustrated in the specification herein.”

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**
- **No** maintenance fee
Plant Patent?

- Grape Plant
- Bamboo Plant
- Tulip Plant
- Algae
- Mushroom
- Bacterium

Utility Patent

- Patentability requirements: utility, new, non-obviousness, written description, enablement, best mode
- Possible to protect a class of varieties with specific traits, plant parts, and methods of producing or using plants
- 20 years from date of filing
- Right to exclude others from making, using, selling, offering for sale, and importing the claimed invention in the U.S.
Utility Patents

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.

Commercial Agricultural Products
Examples

<table>
<thead>
<tr>
<th>Product</th>
<th>Genetic Modification</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>soybean, corn</td>
<td>herbicide tolerance</td>
<td>improve weed control</td>
</tr>
<tr>
<td>cotton, corn</td>
<td>insect resistance</td>
<td>reduce insecticide use</td>
</tr>
<tr>
<td>oilseed rape</td>
<td>heat stability</td>
<td>improve processing quality, permit new food uses for healthier oils</td>
</tr>
<tr>
<td>corn, sunflower, soybean, rice</td>
<td>improved nutrition</td>
<td>increase essential amino acids, vitamins, and...</td>
</tr>
</tbody>
</table>
**New Plant Varieties**

Number of Plant Patents Granted (Distributed by Year of Grant)

**New Plant Varieties and Technologies**

Number of Plant Utility Patents Issued
**Benefits of New Varieties**

- 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

**Questions?**

- [http://www.uspto.gov/web/offices/pac/utility/utility.htm](http://www.uspto.gov/web/offices/pac/utility/utility.htm)
QUESTIONS?