

Patent & Non-Patent Protection for Plant Innovation in the U.S.

Jay P. Kesan
University of Illinois at Urbana-Champaign

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J.E.M. v. Pioneer, U.S. Sup. Ct. (2001)

- 35 U.S.C. §101 encompasses seed-grown plants
- PVPA is “patent-like” regime
 - Not exclusive venue for IP protection of seed-grown plants
 - Utility patents can co-exist
- Statutory construction rationale
- Did not resolve policy question on optimal combination of IP rights for plants

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Doctrinal Analysis: Essential Features of PVPA

- Protectability Requirements:
 - Novelty + DUS + Deposit
 - No non-obviousness – §103
 - No enablement – §112
- Scope of Rights – like copyright?

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Doctrinal Analysis: Essential Features of PVPA

- Limitations on Rights
 - Non-commercial use exemption
 - Breeding/Experimentation exemption
 - Developing vs. producing new variety
 - Saved-seed exemption
 - Compulsory licensing
- Term
 - 20 years from issuance

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Plant Variety Protection Act – Empirical and Conceptual Analyses

- PVP prosecution
- Licensing of PVP varieties
- Enforcement actions
- Conceptual Analysis
- Conclusions

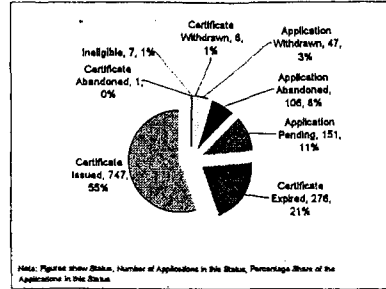
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PVP Prosecution – Empirical Analysis

- PVP Examination by PVPO – “DUS” criteria, formal requirements, such as seed deposit
- 198 crop varieties eligible
- Dataset – 1,343 soybean and 904 corn PVP certificates from 1971 to May 2002
- Status of dispositions; issuing durations; pending durations; trends in number of applications and complexity of applications

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Status of Applications for PVP Certificates for Soybeans



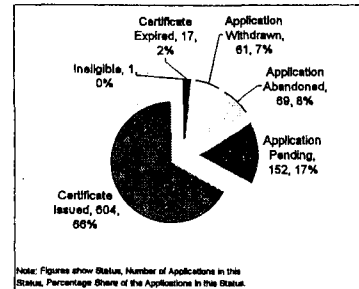
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Status of Applications for PVP Certificates for Soybeans

Status	Counts
Certificate Abandoned	1
Ineligible	7
Certificate Withdrawn	8
Application Withdrawn	47
Application Abandoned	106
Application Pending	151
Certificate Expired	276
Certificate Issued	747
Total	1343

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Status of Applications for PVP Certificates for Corn



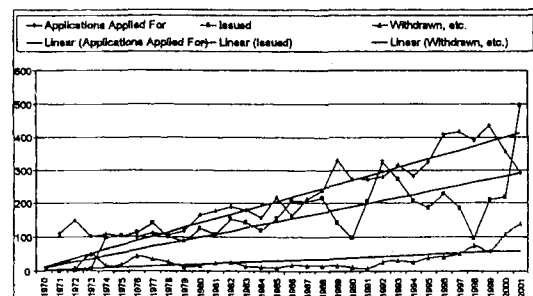
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Status of Applications for PVP Certificates for Corn

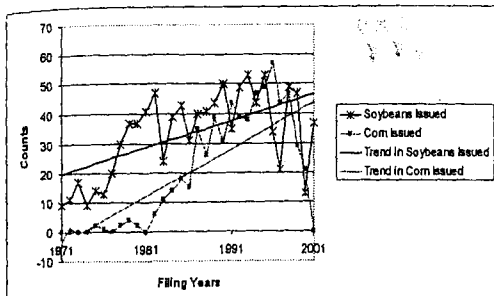
Status	Counts
Ineligible	1
Certificate Expired	17
Application Withdrawn	61
Application Abandoned	69
Application Pending	152
Certificate Issued	604
Total	904

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Applications Processed + Applications Applied for: 1970-2001



Numbers of Applications Issued



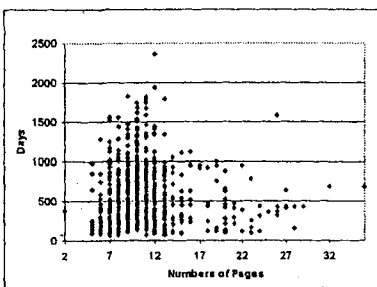
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Summary Statistics of Duration Data and Number of Pages on Soybean PVP Certificates

	Issuing Durations in Days	Pending Durations in Days	Numbers of Pages
Min	58	74	2
Max	2359	2237	36
Mean	577.7238372	1196.350993	10.59883721
Mode	502	1802	10
Std.Dev.	374.0831071	682.7516503	3.654570581

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Issuing Durations against Numbers of Pages for Soybean PVP Certificates



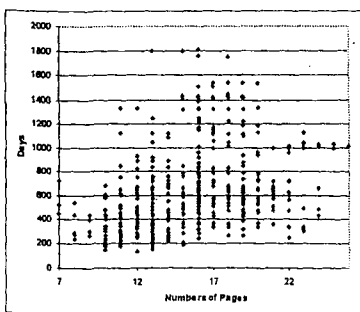
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Statistics of Duration Data and Numbers of Pages on Corn PVP Certificates

	Issuing Durations in Days	Pending Durations in Days	Numbers of Pages
Min	134	39	7
Max	1810	1506	26
Mean	625	713.4539474	15
Mode	1536	1439	13
Std. Dev.	376.8721395	460.3514471	3.586954963

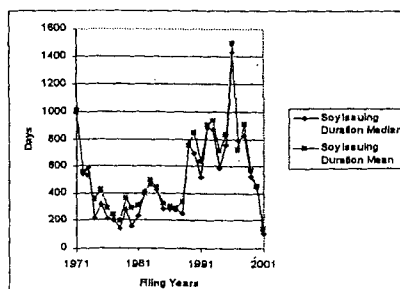
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Issuing Durations against Numbers of Pages for Corn PVP Certificates



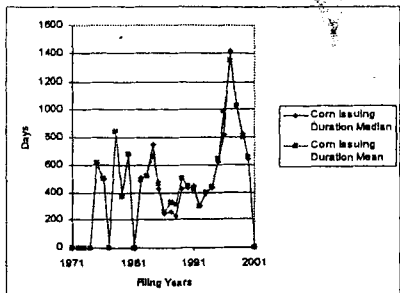
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Median and Mean Issuing Durations for Soybeans

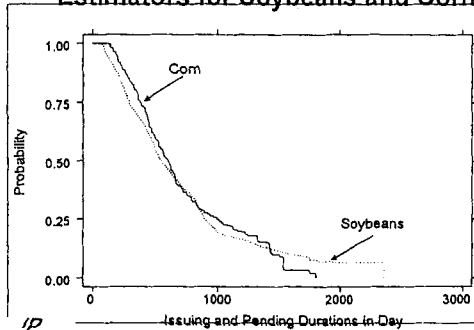


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Median and Mean Issuing Durations for Corn



Kaplan-Meier Survival (Duration) Estimators for Soybeans and Corn



Licensing of PVP-protected varieties

- Bag-tag/seed-wrap licenses-with seed
 - Contracts enforcing PVP, utility patent or trade secret protected varieties
 - Non-propagation clause based on IP regime
- No other licensing of solely PVP-protected varieties
- DuPont/Pioneer case study – compare utility patent and PVP licensing

PVP Enforcement Actions

- Very few (6 cases) reported decisions in the last 30 years
- Typically, involve “brown-bagging” by farmers or retailers
- *Asgrow v. Winterboer* – tightened the crop exemption
- *JEM v. Pioneer* – permit overlapping PVP and utility patent protection

Conceptual Analysis 1

- PVPA is a narrow and porous regime
- Scope of protection
 - Slight modification is sufficient for non-infringement
 - “Essentially derived varieties” (EDVs) – molecular markers to show relatedness
 - Does not permit knock-off of protected variety
- Research (breeding) exemption
 - Cannot go after other breeders/competitors
 - Better than trade secrets – no “chasing the selfs”

Conceptual Analysis 2

- Crop (“saved-seed”) exemption
 - Permits saving seed and selling seed for feed and food, but not for propagation
 - Need to prove purpose of sale to prove infringement by determining intent
- Explains why the ex ante story is non-existent
 - No increase in prices above competitive levels
 - No increase in commercial or experimental yields

Conceptual Analysis 3

- Explains why the ex ante story is non-existent
 - No increase in private investment in plant breeding based on PVPs because no excludability or appropriability
 - A branding and marketing tool
 - Parallels the SCPA as another *sui generis*, technology-specific, legislatively created IP regime that made little impact

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What Does the PVPA Purchase?

- International UPOV obligations
- PVP favored thus far by small breeders
 - Patents are expensive; threshold for protection is high
 - Get marketing benefits from PVP
 - But may change their strategy after JEM
- PVPA is better than trade secret protection in a limited sense

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Conclusions 1

- PVPA: Lofty objectives – patent-like protection tailored for specific technology – plant innovation – but expected to parallel patent benefits by nevertheless striking a different balance between protected and permitted activities
- PVPA: Pedestrian execution – demand a lot and grant little
 - Plant biotechnology is increasingly expensive; typical high-tech with high fixed costs and low variable costs
 - Narrow, Swiss-cheese regimes cannot capture benefits of utility patents

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Conclusions 2

- Are we better off focusing on improving utility patent protection for plant innovation? Or is the PVP optimal for plants?
- Indeed, the very existence of the PVPA poses political and legal problems by exerting pressure on robust, utility patent protection for agricultural biotechnology

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