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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS

Twenty-Seventh Session
Alexandria, Virginia, United States of America
June 16 to 19, 2009

REPORT

adopted by the
Technical Working Party on Automation and Computer Programs

Opening of the Session

1. The Technical Working Party on Automation and Computer Programs (TWC) held its twenty-seventh session in Alexandria, Virginia, United States of America, from June 16 to 19, 2009. The list of participants is reproduced in Annex I to this report.

2. The TWC was welcomed by Mr. John Doll, Acting Undersecretary of Commerce for Intellectual Property and Acting Director of the United States Patent and Trademark Office.

3. The session was opened by Mr. Gerie van der Heijden (Netherlands), Chairperson of the TWC, who welcomed the participants.

Adoption of the Agenda

4. The TWC adopted the revised agenda as reproduced in document TWC/27/1 Rev., according to the order of agenda items agreed at the session.

Short Reports on Developments in Plant Variety Protection

(a) Reports from members and observers

5. Mrs. Anne Marie Grünberg, Supervisory Patent Examiner, United States Patent and Trademark Office and Mr. Paul M. Zankowski, Commissioner, Plant Variety Protection Office, United States Department of Agriculture (USDA) made presentations on plant variety protection in the United States of America. A copy of their presentations is provided in Annex II to this document.

6. The expert from Australia reported that, since 1988, Australia had received over 6140 applications for plant breeder's rights. In the 2008-2009 financial year to June 2009, 310 applications for plant breeder's rights had been filed and 220 certificates of grant had been issued. The number of filings was likely to be slightly lower than in the previous financial year (372 were filed in 2007/08). However, the number of grants issued was higher (216 were granted in 2007/08). He added that, since 2005, descriptions of all new varieties were entered into a database using the online Interactive Variety Description System (IVDS). Those descriptions were then published in the Plant Varieties Journal. Over 1000 descriptions of new varieties had been published using the IVDS. In addition, a further 800 technical descriptions published prior to 2005 had been entered into the IVDS as part of an ongoing program to enter all existing descriptions into the database. Around 43% of all descriptions of new varieties published since 1988 were included in the IVDS at present. In other developments, he reported that a project to establish a system for on-line filing of new applications was in the early stages of scoping and development. It was envisaged that this system would allow applicants to submit new applications through a controlled system with improved quality and efficiency over paper applications. Applications for ornamental varieties continued to be the most numerous (more than 50%). In addition, Australia continued to receive a significant number of applications for the first variety of a species, most of which were from Australian species and published knowledge of the morphological variation of the species was often sparse. He explained that this presented challenges in preparing national descriptors and identifying suitable reference varieties. As a result, the DUS trials were typically small, generally including only one or two reference varieties.

7. The expert from Brazil reported that field trials were being carried out to identify example varieties of soybean, eucalyptus, *Urochloa*, wheat, rice and tobacco. He reported the development of a project for electronic application systems which would be presented during the session.

8. The expert from Denmark reported that the control of certified seed had recently been moved to the Department of Variety Testing of the Plant Directorate. That meant that all matters related to variety testing were coordinated from Tystofte.

9. The expert from the Community Plant Variety Protection Office (CPVO) of the European Community reported that European Community had been a member of UPOV since 2005. Within the European Community, the CPVO was the institution which implemented the regulation on plant variety rights. With a single application and a single procedure, applicants could obtain a title of protection that was valid throughout the territory of the European Union. National systems still existed and the applicant had the choice to apply at CPVO or at the national level. The CPVO was self-financed by the application fees and fees for the maintenance of titles of protection in force. Approximately 3,000 application had been filed

in 2008 and there were about 16,000 titles of protection in force. He reported on a number of IT projects, both existing or under development, as follows: (a) Electronic filing of applications, a report would be provided during the TWC session. (b) Denominations, including some additional developments: in July 2005, the CPVO launched a tool on its website to test proposed variety denominations for similarity. This website contained a database and a searching software linked to it. The user entered the proposed denomination and the species name and the software provided a list of denominations ranked by order of similarity. The CPVO database contained more than half a million denominations from national listing and plant variety rights registers of the European Union and UPOV member States. The CPVO cooperated with UPOV for the population of the database in the frame of a memorandum of understanding (MoU). The CPVO database was available on the basis of a restricted access to EU-based applicants and their procedural representatives, to National authorities of EU member states, to the European Commission and to UPOV. The CPVO had a project to develop this website towards a greater cooperation with EU member States. Proposals received at national level could be communicated to the CPVO before publication via the website and the CPVO could provide an opinion about the suitability of the denomination proposals. In the case of disagreement as to the suitability of the denomination proposal, exchanges of views could take place but the final decision remained with the national authority. (c) Variety descriptions; the maize, potato, rose and peach databases. The CPVO had co-financed a number of R&D projects that consisted of the creation of databases of variety descriptions: the "Maize database", a presentation of which had been made at the twenty-sixth session of the TWC, by Mr. Grégoire. The database was regularly updated by participants; the "Potato database", which included molecular marker profiles of potato varieties, key morphological characteristics and a photo library with light sprout pictures. The aim was to rapidly identify plant material submitted as a reference for a DUS test; the "Rose database", which included molecular marker profiles of rose varieties, key morphological characteristics and a photo library with several standardized photographs of each variety. The project would serve as a basis to attach molecular profiles to variety descriptions or to store DNA standard samples for varieties granted Community plant variety rights; and the "Peach database", which included molecular marker profiles of peach varieties, key morphological characteristics and a photo library with standardized photographs of each variety. The project was aimed at the creation of a complete database for improved management of the reference collection. (d) Extranet client: the CPVO had developed an extranet website dedicated to its clients. The aim of this website was to enable CPVO clients based in the European Union to consult information about their files (status of applications, pending fees, debit and credit notes) via restricted access with login and password. Clients could also retrieve documents (print outs of gazettes etc.). (e) Publication of variety descriptions: a project to publish on its web site variety descriptions of protected varieties in pdf format together with photographs provided by applicants in the ornamental and fruit sector; and (f) Paperless Office: an electronic document management system had been developed and the CPVO was moving to a paperless system.

10. The expert from Germany reported that an on-line application system was available for more than 400 crops and that there was a project to exchange data with the CPVO, with the first step being to create an interface with the CPVO data. He reported that , in Germany, data from all other European Union member States would be downloaded monthly and that it was planned to expand that procedure to non-European Union countries.

11. An expert from France reported on projects for an information system for molecular data management and for data capture. He added that GEVES would end its activities at La Minière station in 2009, and would begin in a new administration and field station near

Angers, involving the recruitment of 30 new staff. He reported that GEVES had received ISO 9000 accreditation in Spring 2009.

12. An expert from Japan reported that during the 2008 fiscal year (April 2007 to March 2008) 1,274 application for plant breeder's rights were filed, which represented 287 less than in 2007. The number of foreign applications was 365, representing 29% of the total. The main three countries were the Netherlands, Germany and Israel. He added that 1,193 titles of plant breeder's rights were granted during 2008. He also reported that, in April 2008, the Variety Registration Data Integrated Portal System (VIPS) entered into use. VIPS had two main objectives: to promote an efficient and accelerated registration of plant varieties and to provide a system for the management of the plant variety registration process. In 2007, the average period to register a plant variety was 2.9 years and the objective for the national plan for the promotion of intellectual property in 2008 had been 2.5 years: the resulting average period was 2.58 years. Efforts would be made to achieve the objective during 2009.

13. The expert from the Netherlands reported that the various database systems involved in the registration and protection of plant varieties were being unified in a single NaVision system. He reported that a new image analysis system was under development and that studies were undergoing to investigate means to use information from other countries in the management of reference collections.

14. The expert from Poland reported that a project for the automation of measurements in oilseed rape varieties had been initiated and would continue during 2009.

15. Experts from Republic of Korea reported as follows: an expert from the Korean Seed and Variety Service (KSVS) reported that, during 2009, 295 applications for plant breeder's rights had been flied until May 31, of which, 220 had been electronic applications. He added that, including those applications, the total number of applications filed was 4,214 and the total number of plant breeder's rights granted since the establishment of the system in 1997 was 2,667. He also reported that, from May 1, 2009, protection was provided for varieties of all plant genera and species, except for varieties of strawberry, raspberry, tangerine, blueberry, cherry and seaweed. He explained that, during 2009, the plant variety protection system would be improved to cope with an increase in the number of applications. He further reported that the twenty-sixth session of the TWC had been hosted in Jeju island, from September 2 to 5, 2008 and that the thirty-eighth session of the Technical Working Party for Agricultural Crops (TWA) would be hosted in Seoul, from August 30 to September 4, 2009. He reported that, in 2007, KSVS had launched a training program for countries where legislation on plant breeder's rights was under development. The third session of the training would be held from June 18 to July 3, 2009, and that 15 participants from 10 countries were expected to attend. An expert from the Korea Forest Seed & Variety Center (KFSVC) reported that KFSVC was responsible for the forest plant variety protection of ornamental trees, plant flowers and mushrooms. He reported that, in 2008, according to the Seed and Industrial Act 11, 15 forest species, including chestnuts, mushrooms and argy wormwood, were entitled to variety protection. To June 2009, a total of 34 applications had been made; for chestnut, mushroom, spreading hedyotis and argy wormwood, and were under DUS examination. In 2009, KFSVC was preparing the national test guidelines of several forest species, fruit and ornamental trees, plant flowers and mushrooms, which included, for example wild allium (*Allium victorialis var. platyphyllum*) and mushrooms (*Sparassis crispa*). He explained that KFSVC was established in August 12, 2008 and was affiliated to the Korea Forest Service (KFS) within the Ministry of Food, Agriculture, Forestry and Fisheries (MIFAFF). KFSVC comprised two departments, one team and three branch offices. The

Department of Variety Examination for National Forest Plant Variety Protection system had the following three divisions: Examination support, Variety Examination and DUS test. The Department of Seed and Seedling Management for national management system for all forest seed and seedling, had three divisions: Seed Production, Distribution of seed and seedling and Genetic resources. There were also three branch offices. KFSVC managed 702 ha. of seed orchards. The main purpose of the establishment was the activation of forest variety protection. At present, KFSVC was focused on the following areas: encouraging the development of new forest varieties through the successful settlement of the forest variety protection system; the establishment of the national management system for forest seed and seedling for productivity improvement and the establishment of the management system of forest genetic resources and the activation of its application.

16. The experts from the United Kingdom reported that image analysis had been incorporated in the DUS examination of parsnips and that the Cyclic Control approach continued to be used in DUS testing for grasses.

17. An expert from United States of America reported that the United States Patent and Trademark Office (USPTO) had cooperated with UPOV in the organization of regional activities for the promotion of plant breeder's rights in Trinidad and Tobago and the Republic of Moldova in 2009. She also reported on the organization of a training activity at the Global Intellectual Property Academy of the USPTO during 2008 and 2009.

18. The expert from the American Seed Association reported that a position paper on plant variety protection and a paper on molecular markers for DUS examination would be revised in July 2009.

(b) Reports on developments within UPOV

19. The TWC received an oral report from the Office of the Union (Office) on latest developments within UPOV, a copy of which is provided as Annex IV to this document.

Molecular Techniques

20. The TWC received a report on developments within UPOV concerning molecular techniques, on the basis of document TWC/27/2.

21. Several participants considered that the TWC could provide assistance to the BMT in the development of statistical tools as well as databases of molecular markers and encouraged cooperation between the TWC and BMT.

TGP Documents

22. The TWC considered the TGP documents below in conjunction with document TWC/27/3.

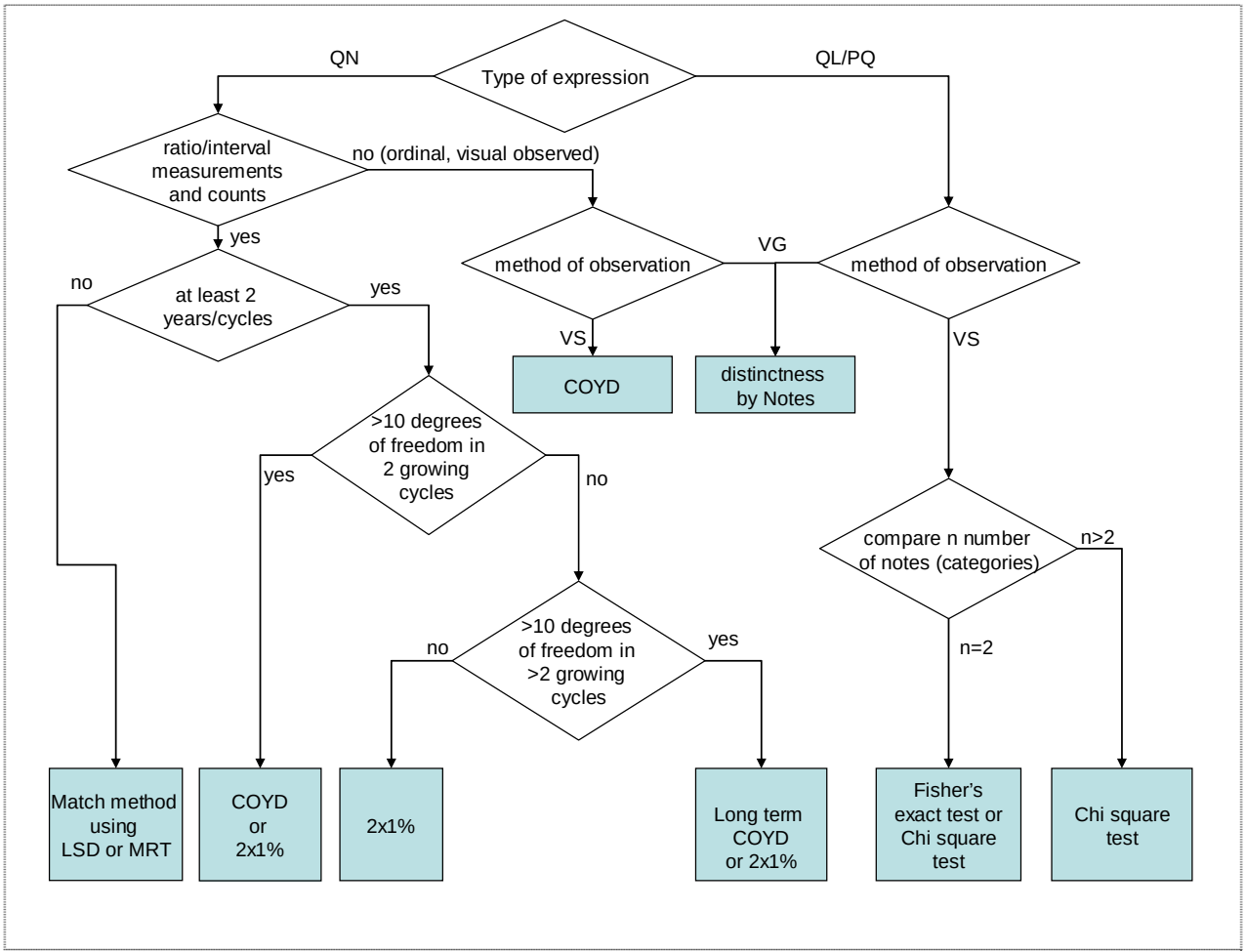
(a) New TGP documents:

TGP/8 Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability

23. The TWC discussed documents TGP/8/1 Draft 13 and TWC/27/11, and agreed to propose the following changes to document TGP/8/1 Draft 13:

Introduction	to read "PART II: TECHNIQUES USED IN DUS EXAMINATION: includes, in particular, details on certain techniques referred to in documents TGP/9 "Examining Distinctness", and TGP/10 Examining Uniformity.
General	to provide an explanation of the term "reference variety" throughout the document (e.g. COY)
PART I	
1.1	text in square brackets to be deleted
1.3.1.2	to delete "s 1.2.2.5 and"
1.3.2.2	to read "If multiple growing trials are used as explained in sections 1.3.1.(a) and (c), DUS could be examined at all growing trial locations. However, in general, DUS is not examined at all growing trials locations."
1.5.3.1.7 (table)	title of third row to read "Variety mean / Statistical analysis of records for a group of plants / [Replicate plots for group data records] / (MG/MS)
1.5.3.1.7 (table)	to explain the terms MG, MS, VG, VS
1.5.3.3.2	to be deleted
1.5.3.3.4.6	second sentence to read "The blocks should be formed so that the variation between plots within each block is minimized.
1.5.3.3.7.2.6 (table)	to delete " "
1.5.3.3.7.2.6 (table)	to delete " "
1.5.3.3.7.4	to be deleted
2.3	first paragraph to be deleted
2.3.1 (title)	to delete "[/variety means]"
2.3.1	to delete text in square brackets
2.3.1.1.3	to add blank line before 2.3.1.2
3.1	to delete note in box
3.2.1.3 (b)	to read "The 2x1% method to assess distinctness, which has also been developed by UPOV to analyze data from two or more years of growing trials where there are at least a certain minimum number of varieties in trial. Differences are assessed in each year using a statistical test based on a two-tailed LSD to compare the within-year variety means. Whether differences are sufficiently consistent is determined by the requirement that two varieties are

	significantly different in the same direction at the 1% level in both years, or, where trials are conducted in three years, in at least two out of three years. Details of the 2x1% method are given in document TGP/8 Part II section 4."
3.2.1.3 (c)	to read "The Match method to assess distinctness was developed for use where the trials are conducted by the breeder in the first year and examined by the testing authority in the second year (see document TGP/6 section 2/1). They typically involve relatively small scale trials. Whether differences are sufficiently consistent is tested using a statistical test (eg LSD, MRT, Chi-Square or Fisher's Exact) to gauge whether the differences in the second year are significant and agree with the "direction of the differences" declared by the breeder in the first year. The choice of statistical test depends on the type of expression of the characteristic concerned. Details of the Match method are given in document TGP/8 Part II, Section 5."
3.2.1.3	to delete the words "and is discussed below"
3.2.1.4, 3.2.1.5	to be deleted and to be replaced by an explanation that "In the context of consistency and harmonization, it should be noted that different statistical methods will produce different results."
3.2.1.5	second sentence to be deleted
3.3 (title)	to read "Summary of selected statistical methods for examining distinctness"
3.3.1 (table)	- to update the minimum degrees of freedom according to changes agreed for the relevant methods (see below) - to delete "Distribution" column - to replace Chi square and Fisher's exact test with row for Match method - to add a column to indicate method of observation as "MS/VS" for COYD and Long Term COYD, with a note that those methods might also be applicable for MG and VG in certain circumstances; and to indicate "MS" for 2x1% method and "VS" for Match method
3.3.1	flow diagram to read as follows:



PART II	
Title	to read "Selected techniques used in DUS examination"
General	to check that the term "clearly distinct" is replaced by "clearly distinguishable", "distinct" or another suitable term (e.g. 6.1.9)
3.1	to read "– there should be at least 10, and preferably at least 20, degrees of freedom for the varieties-by-years mean square in the COYD analysis of variance, or if there are not, then Long-Term COYD can be used (see 3.6.2 below);"
3.7	to read "The COYD method can be applied using TVRP module of the DUST package for the statistical analysis of DUS data, which is available from Dr. Sally Watson (Email: info@afbini.gov.uk) or from *http://www.afbini.gov.uk/dustnt.htm.* Sample outputs are given in Part II section 3.10 *[cross ref.]*."
3.9.2.1, 3.9.2.2	to replace "SE" with "standard error" (3 occurrences)
3.9.2.5	formula to be centrally aligned
4. (title)	to read "2X1% METHOD"
4.1.1	to add indent to read "– there are at least 10, and preferably at least 20, degrees of freedom"

4.2 (title)	to read "The 2X1% method"
4.2.1	second sentence to read "The tests in each year are based on Student's two-tailed t-test of the differences between variety means with standard errors estimated using the residual mean square from the analysis of the variety x replicate plot means."
4.2.2	to delete final sentence of second indent
New Section (Match method)	to read " 5. MATCH METHOD <u>5.1 Requirements for application of method</u> 5.1.1 The Match method is appropriate for assessing distinctness of varieties where: - observations made on a plant (or plot) in the second year are compared to observations made by the breeder in the first year. - there are claimed differences between plants (or plots) of a variety based on information from the first year trial - the requirements of the method depend on the particular statistical test that is used (e.g. LSD, Multiple Range Tests (MRT), Chi-Square or Fisher's Exact). <u>5.2 Match Method</u> 5.2.1 The Match method to assess distinctness was developed for use where the trials are conducted by the breeder in the first year and examined by the testing authority in the second year (see document TGP/6 section 2/1). Whether differences are sufficiently consistent is tested using a statistical test (eg LSD, MRT, Chi-Square or Fisher's Exact) to gauge whether the differences in the second year are significant and agree with the "direction of the differences" declared by the breeders in the first year. The choice of statistical test depends on the type of expression of the characteristic concerned. For two varieties to be distinct using the Match method, the varieties need to be significantly different in the same direction claimed by the breeder in the first year. 5.2.2 The requirements of the method depend on the particular statistical test that is used (e.g. LSD, MRT, Chi-Square or Fisher's Exact). For quantitative characteristics, the statistical test may be based on a one-tailed LSD, if there is one candidate, or on a one-tailed MRT, if there is more than one candidate included in the growing trial. A Chi-square test or Fisher's exact test may be used for pseudo-qualitative or qualitative characteristics where the requirements for those tests are met. 5.2.3. The Match method typically involves relatively small scale trials. The number of candidate and reference varieties in the trial is limited to the most similar varieties of common knowledge. Although these tests are most useful in trials of cross-pollinated varieties, they can be similarly applied to trials of self-pollinated and vegetatively propagated varieties provided the relevant criteria are met.
5.1	to be deleted

5.2	to be deleted
5.3 title	to read "Chi-square test applied to contingency tables"
5.3 general	section to be edited according to the comments below, the proposals agreed by the TWC at its twenty-sixth session (see document TWC/26/29 "Report", paragraph 29: items 21, 23, 21) and any written comments provided to Mr. Nik Hulse by July 3, 2009. Mr. Hulse to prepare a new draft of the section for circulation by the Office by July 17, 2009 to the TWC, with a request for comments to be provided July 31, 2009. On the basis of comments received, Mr. Hulse to prepare a text by August 3, 2009, to be presented to the Technical Working Party for Agricultural Crops (TWA) and subsequent Technical Working Party sessions in 2009.
5.3	(a) to provide list of requirements and circumstances for the use of Chi-square test applied to contingency tables, which would include: - the only source of variation should be caused by random sampling, e.g. there should be no variation due to soil conditions, etc. - useful where observations on a characteristic are allocated to two or more categories (classes) - the minimum expected value in each category should be five (b) to explain contingency tables
5.3.2	to read "In some cases, distinctness may be established by classifying individual varieties into broad groups and demonstrating statistically different grouping patterns for different varieties. Such examples include counts based on the flower color groups - red, pink or white etc. and the disease/pest/nematode infection classes. Data based on counts of individuals in a sample/population belonging to each of several classes require a different kind of statistical analysis. A method commonly used for analyzing such enumeration data is called the *Chi-square* (χ^2)."
5.3.6	to indicate "contingency table" in the title
5.3.16 to 5.3.19	to be deleted
6.	section to be edited according to the comments below and any written comments provided to Mr. Nik Hulse by July 3, 2009. Mr. Hulse to prepare a new draft of the section for circulation by the Office by July 17, 2009, with a request for comments to be provided by July 31, 2009. On the basis of comments received, Mr. Hulse to prepare a text by August 3, 2009, to be presented to the Technical Working Party for Agricultural Crops (TWA) and subsequent Technical Working Party sessions in 2009. (as for Section 5)
6.	to provide list of requirements and circumstances for the use of the method
6.2	to be deleted
7.1	note in square brackets to be deleted
7.1.5.4	note in square brackets to be deleted
8.1	to delete "COYU is an appropriate method for use in assessing the uniformity of varieties"
8.9	to read "The COYU criterion can be applied using COYU module of the DUST

	software package for the statistical analysis of DUS data. This is available from Dr. Sally Watson (Email: info@afbini.gov.uk) or from http://www.afbini.gov.uk/dustnt.htm."
8.11	to delete paragraph after Table 1
9.1 Title	to read "Uniformity assessment on the basis of relative variance method"
9.1 Introduction	to add an introduction based on Section 9.4.4 and to add a requirement that there should be a normal distribution for the method to be used.
9.1	to read "The relative variance method may be applied to any measured characteristic that is a continuous variable, irrespective of the method of propagation of the variety."
9.1.1	to add space before "∞"
9.6	to be deleted

TGP/11 Examining Stability

24. The TWC considered document TGP/11/1 Draft 5.

25. The expert from Australia explained that, in Australia, stability was examined for seed-propagated varieties by growing two generations and verifying that there was no difference in the characteristics observed.

26. An expert from the United States of America reported that, in the United States of America, distinct plants within a variety were identified according to the following definitions of "off-type" and "variant":

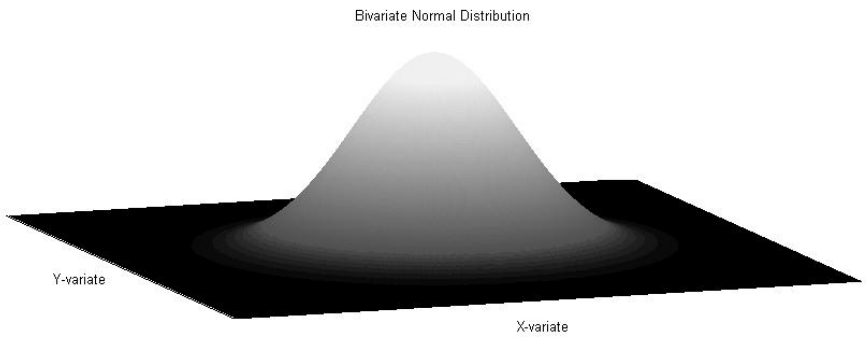
"Variant: The term "variant" means any seed or plant which: (a) is distinct within the variety but occurs naturally in the variety; (b) is stable and predictable with a degree of reliability comparable to other varieties of the same kind, within recognized tolerances, when the variety is reproduced or reconstituted; and (c) was originally a part of the variety as released. A variant is not an off-type."

"Off-type: The term "off-type" means any seed or plant not part of the variety in that it deviates in one or more characteristics from the variety as described and may include: a seed or plant of another variety; a seed or plant not necessarily any variety; a seed or plant resulting from cross-pollination by another kind or variety; a seed or plant resulting from uncontrolled self-pollination during production of hybrid seed; or segregates from any of the above."

TGP/14 Glossary of Technical, Botanical and Statistical Terms Used in UPOV Documents

27. The TWC discussed documents TGP/14/1 Draft 9 and TWC/27/12. The TWC proposed the following changes to document TGP/14/1 Draft 9:

TGP/14/1 Draft 9 Section 3 "Statistical Terms"	
General	To add the following introductory text: "The definitions included in the glossary are in relation to the use of these

<table>
<tr><td></td><td>terms in DUS examination”</td></tr>
<tr><td>Bivariate Normality</td><td>To add to following illustration:
 
</td></tr>
<tr><td>Contingency Table</td><td>to read “A contingency table is a table showing the responses of subjects to one factor as a function of another factor. For instance, the following contingency table shows a characteristic as a function of different varieties (the data are hypothetical). The entries show the number of plants for each variety with particular notes for a characteristic.
<table>
<tr><th>Characteristic
Variety</th><th>State 1</th><th>State 2</th><th>State 3</th></tr>
<tr><td>Variety A</td><td>18</td><td>20</td><td>2</td></tr>
<tr><td>Variety B</td><td>3</td><td>10</td><td>27</td></tr>
<tr><td>Variety C</td><td>6</td><td>24</td><td>10</td></tr>
</table></td></tr>
<tr><td>Random effect</td><td>To be deleted</td></tr>
<tr><td>Random Term/ Random Factor</td><td>to read “Random Term / Random Factor: A factor is random when the levels under study can be considered a random sample drawn from some large homogeneous population. A goal of the study may be to make a statement regarding the larger population. See also factor.”</td></tr>
</table>

(b) Revision of TGP documents:

TGP/7 Development of Test Guidelines

28. The TWC considered documents TWC/27/3 and TGP/7/2 Draft 3 and agreed to propose the following amendments to document TGP/7/2 Draft 3:

General	to replace “range of variation” with “level of variation”, or where the General Introduction is quoted, to explain that the term “level of variation” is considered to be more appropriate than the term “range of variation”, which has been used in the General Introduction (see, for example, Chapter 6.4).

UPOV Information Databases

29. The TWC considered the information provided in document TWC/27/4.

30. The TWC noted that the Administrative and Legal Committee (CAJ), in deciding to proceed on the basis of the proposals in Annex IV to document TWC/27/4, had agreed that there should be a future review of whether to delete fields that are not used to a significant extent (see document TWC/27/4, paragraph 20). It was noted that the CAJ had agreed that the review should be based on an analysis of the use of the fields in the UPOV-ROM. In that regard, the TWC agreed to propose to the Technical Committee and the CAJ that it invite the TWC to conduct that analysis of the fields in the UPOV-ROM.

31. With regard to the checking of similarity of variety denominations in the Plant Variety Database, the TWC heard that the CPVO had developed a software for assessing similarity of denominations. The TWC welcomed the offer of the expert from the European Community to make a presentation of that software at its twenty-eighth session with a view to possible inclusion of the software in document UPOV/INF/Software.

DUSTNT programs

32. The TWC considered document TWC/27/9, presented by Mrs. Sally Watson (United Kingdom).

33. The TWC considered that the document provided a good basis for an introduction to the DUSTNT software, which it agreed should be offered on opening the software package. It agreed that the text of paragraph 2 of the document should be elaborated further and that a clear explanation should be provided to distinguish between the modules for implementing COY and the other modules included in the DUSTNT package. It agreed that a form of "pop-up" style message should be provided on opening the DUSTNT package, directing users to the explanation above.

Data loggers

34. The TWC noted the information provided in document TWC/27/16 and agreed that the TWC experts should be invited to update that document for subsequent TWC sessions.

35. Mr. Christophe Chevalier (France) introduced document TWC/27/17 and made a demonstration of the SIRIUS system for data capture. A copy of that presentation is provided in document TWC/27/17 Add..

36. In reply to a question of one expert from United Kingdom Mr. Chevalier explained that SIRIUS had been developed on WINDEV and HYPERFILE database because those tools had proved to be reliable for the development of the GAIA program. He added that this year was the second year of use of SIRIUS. The expert from Australia asked whether there were any limitations in respect of the size of the trial, in particular if SIRIUS could be used in small trials. Mr. Chevalier explained that it was used in small trials, but it was particularly useful in large trials. He added that the tables contained in SIRIUS could be linked to other application

programs, such as Excel or Access. The expert from the Netherlands requested information on the type of data logger required for SIRIUS. It was explained that the only requirement was a minimum resolution of the screen of the data logger (600x480). The expert from Denmark observed that it would be very useful if the SIRIUS system of data capture could be linked to the DUSTNT package, in order to get a complete system covering data capture and analysis. The expert from the European Community asked if the system could be easily updated if the Test Guidelines were changed. Mr. Chevalier clarified that the SIRIUS system was easy to update and that it was possible to use the structure of the previous year or another. The expert from Germany explained that the SIRIUS system had been tested in Germany with positive results and consideration was being given to whether to make the necessary arrangements to incorporate the software in their system. Mr. Chevalier explained that the SIRIUS system also help GEVES to control the trial design when used in field trials carried out by other institutions on behalf of GEVES.

Exchangeable software

37. The TWC considered documents TWC/27/7, TWC/27/19 and UPOV/INF/Software Draft 2. The TWC noted that the e-mail address for Dr. Sally Watson, concerning DUSNT software, should be amended to info@afbini.gov.uk.

38. Based on the information provided by experts from France under agenda item 12 "Data Loggers", the TWC agreed to propose the inclusion of the SIRIUS system for data capture in document UPOV/INF/Software under the section "(e) Data recording and transfer". It was agreed that Mr. Christophe Chevalier would provide the necessary information to the Office of the Union.

39. On the basis that the TWC had agreed to recommend to the Technical Committee to include the SIRIUS software in document UPOV/INF/Software, Mr. Chevalier requested that, in parallel with that process, consideration be given by the Office to the translation of the user guide into English. The Office agreed to consider that request on the basis that the experts from France would check any translation provide by the Office.

40. The TWC agreed to invite experts of the Russian Federation to make a presentation on the software listed in document TWC/27/19, at its twenty-eighth session, as a basis for consideration of inclusion of the software in document UPOV/INF/Software.

41. The TWC Chairman invited proposals of other software for consideration by the TWC at its twenty-eighth session.

Development of COY

(a) COYU: possible proposals for improvements to COYU

42. The TWC considered document TWC/27/15, on the basis of a presentation by Mr. Adrian Roberts (United Kingdom). A copy of the presentation is provided in document TWC/27/15 Add.

43. Mr. Kristian Kristensen (Denmark), co-author of the document, explained that, in view of the findings of the document presented, he considered that it would be appropriate to find a better method to replace the moving averages for calculating the mean-variance relationship in COYU. The expert from Germany considered that there were two ways to approach the problem: to decide taking into account the data under analysis; or to consider historical data and decide on the best transformation, but he expressed doubts that a single approach would be suitable for all situations. He clarified that the way COYU made the calculations at the moment was acceptable, but it was nevertheless desirable to find a solution. The Chairman recalled a previous discussion on this subject presented at the TWC in document TWC/11/2 and considered that including the smoothing spline transformation in the model analysis would reduce the number of degrees of freedom and might partially solve the problem of bias. The expert from UK explained that the problems went beyond a reduction in the degrees of freedom. He added that the present method consistently showed the same bias in all situations. The expert from Germany reported that, in Germany, estimations had been made with 270 reference varieties and the same problems had appeared. An expert from France noted that the calculation of moving averages is based on a relatively small number of reference varieties, whilst smoothing spline and linear regression are based on all varieties. The TWC agreed that it would be important to evaluate the range of circumstances that needed to be accommodated.

44. The TWC agreed that a new document be prepared for its twenty-eighth session by Mr. Kristian Kristensen and Mr. Adrian Roberts.

(b) A comparison of COYU and a method based on Bennett's Test for coefficients of variation

45. The TWC considered document TWC/27/10, presented by Mr. Wiesław Pilarczyk (Poland).

46. Experts from United Kingdom suggested the use of simulated data would allow a better analysis of the proposed method; in particular, simulated data would facilitate an increase in the number of candidate varieties. The Chairman agreed that the proposed hypothesis for the McNemar test should be that the number of cases with contradictory conclusions be equal in the Bennett method and COYU, but he added that it should tend to be zero. Mr. Pilarczyk replied that the most interesting thing to observe was the number of positive and negative decisions. The expert from Germany asked whether the proposed Bennett method contained the same biases observed in COY. Mr. Pilarczyk considered that, because there was no conversion of data in the Bennett method, it most probably did not contain such a bias.

47. The TWC agreed that a new document be prepared for its twenty-eighth session.

(c) Adjustment to COYD for grouping characteristics

48. The TWC considered document TWC/27/18, presented by Mr. Adrian Roberts (United Kingdom).

49. The expert from Poland asked whether the variety grouping considered in the analysis was also reflected in the design of the field trial. Mr. Vincent Gensollen (France), co-author of the document, confirmed that there was grouping in the field trial. The Chairperson asked Mr. Gensollen for his crops what the benefits of this method were in respect to a normal

COYD. Mr. Gensollen explained that it was not always easy to allocate varieties to the correct group; therefore, the method provided the possibility to analyze varieties which were grouped in the field in order to place the most similar varieties in close proximity. If it became evident that varieties from different groups were similar, it would still be possible to compare them. He explained that inter-specific hybrids were less uniform than the species; therefore, varieties of the parental species could not be used as reference varieties. The Chairman explained that, for the case of grasses, it was common to use quantitative characteristics for grouping and, therefore, overlaps between groups was common. Mr. Roberts explained that, in the case of grouping by a continuous factor, the possibility of using the interaction with the covariate could be taking into account. Another expert from United Kingdom explained that grasses were not grouped in the United Kingdom. The expert from Germany asked what the minimum number of varieties in a group by the proposed method could be. Mr. Roberts explained that the minimum number of varieties per group was one.

50. Mr. Roberts reported that a "COYDG" module was under development within DUSTNT.

51. The TWC agreed that a new document be presented for its twenty-eighth session and request the authors to include a definition of reference variety.

Electronic application systems

52. The TWC noted the developments in UPOV concerning electronic application systems, as set out in document TWC/27/8.

53. The TWC received a presentation on the development of a system for electronic applications in Japan, as set out in document TWC/27/20, presented by an expert from Japan.

54. The TWC received a presentation on the electronic application system in Brazil, as presented by the expert from Brazil. The TWC received a presentation on the development of an online application system by the CPVO, as presented by the expert from the European Community. A copy of those presentations is provided in document TWC/27/8 Add..

55. The TWC noted that exchangeable software for electronic application systems could be included in document UPOV/INF/software, Section (b) "On-line application systems".

Statistical methods for visually observed characteristics

56. The TWC considered document TWC/27/14, presented by Mr. Kristian Kristensen (Denmark).

57. An expert from France noted that the method would make it easier than for Chi-square to check that differences between varieties was consistent over years.

58. The TWC agreed that it would be useful to provide an overview of VS characteristics in UPOV Test Guidelines where the method could be appropriate.

59. For possible future development, Mr. Kristensen agreed to consider the introduction of an indicator (e.g. F3) for variety to observe variation between years and to consider the

possible use of a gamma distribution for the variety-by-year interaction. He also agreed to provide the method with SAS code and to consider how to deal with combining categories where zeros were present in initial categories.

Assessing uniformity by off-types on the basis of more than one sample or sub-samples

60. The TWC considered document TWC/27/13. With regard to the draft questionnaire in the annex to that document, it was agreed that paragraph 1.4 should read as follows "Please complete the attached form with information on how uniformity is assessed by off types for cases where more than one sample or sub-sample are used, as explained in paragraph 1.3."

Variety description databases

61. The TWC noted the information provided in document TWC/27/5 and invited experts to present information on this item for the twenty-eighth session.

TGP Documents (continued)

TGP/8 Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability (continued)

62. The TWC agreed to consider document TWC/27/11 at its twenty-eighth session, as the basis for a future revision of document TGP/8 (document TGP/8/2), subject to the following amendments:

General	to delete sections indicated as deleted and to renumber the document as appropriate
Table of Contents	to produce a single table of contents
Part I	
2.	to provide an introduction to the section from the perspective of a DUS crop expert, i.e. to start from the type of expression of characteristics, based on the sequence in the flow diagram in document TGP/8/1 draft 13, Part I, Section 3.3.1, as amended in this report.
6.	experts from Finland, France, Germany, Italy, Japan, Kenya and the United Kingdom to provide a short description of the principles underlying the detailed methods provided in Part II.
Part II	
6.	existing text to be moved to Part I and Mr. Gerie van der Heijden (Netherlands) and Mr. Nik Hulse (Australia) to provide additional information for Part II
7.1	Mrs. Sally Watson (United Kingdom) to provide an example

Database to research TWC working documents

63. The TWC participants were provided by the expert from Germany with the latest edition of the "Database to research TWC working documents", as prepared by Mr. Thomas Drobek (Germany).

Future Program, Date and Place of the Next Session

64. At the invitation of the European Community, the TWC agreed to hold its twenty-eighth session in Angers, France, from June 28 to July 2, 2010. During the twenty-eighth session, the TWC planned to discuss or re-discuss the following items:

1. Opening of the session
2. Adoption of the agenda
3. Short reports on developments in plant variety protection:
   (a) Reports from members and observers (oral reports by the participants)
   (b) Reports on developments within UPOV (oral report by the Office of the Union)
4. Molecular techniques (document to be prepared by the Office of the Union and documents invited)
5. TGP documents
6. UPOV Information Databases (document to be prepared by the Office of the Union)
7. Variety description databases (document to be prepared by the Office of the Union and documents invited)
8. Exchangeable software (documents to be prepared by the Office of the Union, European Community and the Russian Federation and documents invited)
9. Electronic application systems (documents invited)
10. Variety denominations (document to be prepared by the Office of the Union)
11. Data loggers (document to be prepared by the Office of the Union)
12. Assessing uniformity by off-types on the basis of more than one sample or sub-samples (document to be prepared by the Office of the Union)
13. Development of COY
   (a) COYU: possible proposals for improvements to COYU (document to be prepared by Denmark and United Kingdom)
   (b) A comparison of COYU and a method based on Bennett's Test for coefficients of variation (document to be prepared by Poland)
   (c) Adjustment to COYD for grouping characteristics (document to be prepared by France and United Kingdom)
14. Statistical methods for visually observed characteristics (document to be prepared by Denmark and documents invited)
15. Database for researching TWC documents (CD to be prepared by Germany)
16. Date and place of the next session
17. Future program

Visit

65. On the afternoon of June 18 the TWC visited the National Germplasm Resources Laboratory, at the Beltsville National Agricultural Research Center and received a presentation on the GRIN database and the International Project to Develop a Global Plant Genebank and Information management System ("GRIN-Global"). A copy of the presentations is attached as Annex III.

66. The TWC adopted this report at the close of the session.

[Annexes follow]

ANNEX I

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[End of document]

ANNEX II

Presentation made by

Anne Marie Grünberg, Supervisor Patent Examiner,
US Patent and Trademark Office,

Intellectual Property Protection for Plants in the United States

Anne Marie Grünberg
Supervisory Patent Examiner
Art Units 1661 and 1638

Three Types of Protection

- Plant Patent Act
  - 35 U.S.C. §§ 161-164
- Plant Variety Protection Act
  - 7 U.S.C. §§ 2321 et seq.
- Utility Patent to a Plant
  - 35 U.S.C. §§ 111 (101, 102, 103, 112)

Art Unit 1661- Plant Patents (PLTs)

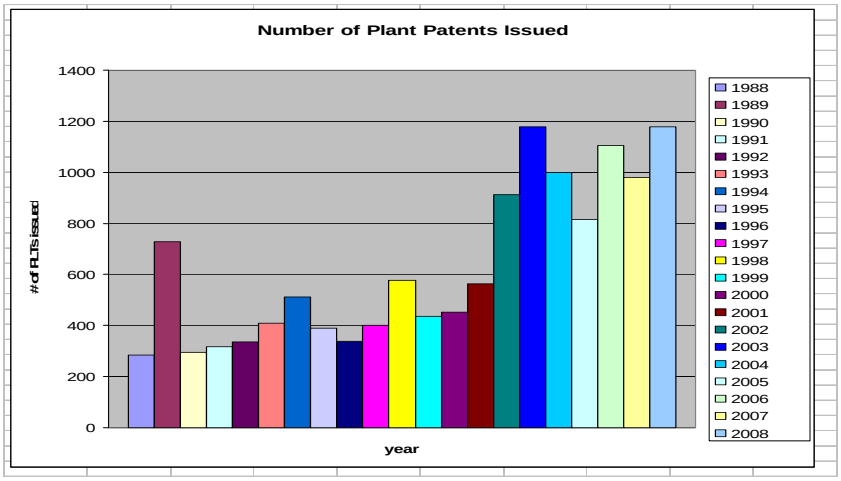
1661

- 1 Expert examiner
- 3 Primary examiners
- 2 Assistant examiners
- 1 hybrid classifier/examiner

Total = 7 examiners

3

Plant Patent Trends



4

Plant Patent Act

- First protection of its kind worldwide - 1930
- Relaxed enablement requirement, new matter
- Applies to asexually reproduced plants (not including edible tuber propagated plants)
- 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
- Total 19,712 plant patents

5

Plant Patent Act

- 35 U.S.C. 161 states:

"Whoever invents or discovers and asexually reproduces any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state, may obtain a patent therefor…"

6

Requirements for Patentability

- Plant is new and distinct from other known varieties (35 U.S.C. 102, 103)
- Plant description as complete as is reasonably possible (112, relaxed enablement requirement)
- Plant has been asexually propagated
- If "discovered," plant was found in a cultivated area
- Plants discovered in the wild are excluded

7

Patentability May be Negated by:

- Lack of novelty
- Sale or public use of the plant in the U.S. more than 1 year prior to filing for U.S. patent
- Description of the plant in a printed publication, combined with public availability (anywhere) more than 1 year prior to filing for U.S. patent (In re Elsner 03-1569 (Fed. Cir. Aug 16, 2004))
- Obviousness in view of the prior art
- Edible tuber propagated plant
- Description not as complete as is reasonably possible

8

Plant Patent Representative Claim

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

9

Art Unit 1638- Plant Utility Patents

1638

- 2 Senior examiners
- 10 Primary examiners
- 5 Assistant examiners

Total = 17 examiners

10

Utility Patent

- Technology neutral
- 20 year protection from date of filing
- Right to exclude others from making, using, selling, offering for sale, and importing the patented plant in the granting territory
- Possible to protect a class of varieties with a specific trait, plant parts and methods of producing or using plant varieties

11

Utility Patents: History

- Diamond v. Chakrabarty, 447 U.S. 303 (1980)
  - Held living things were indeed patentable
- Ex Parte Hibberd, 227 USPQ 443 (PTO Bd. Pat. App. & Int. 1985)
  - Ruled that seeds, plant tissue cultures, and the plant itself are patentable subject matter under the utility patent statute
- J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc., 534 U.S. 124, 60 USPQ2d 1865 (2001)
  - Held newly developed plant breeds fall within the scope of §101, and neither the PPA or PVPA limits this coverage

12

Agronomic Objectives of Plant Utility Patents

- Disease and insect resistance
- Drought and salt tolerance
- Herbicide resistance
- Improvement of fruit and flower quality
- Modification of fatty acid and oil composition
- Increases in amino acids and nutrition
- Improvement of sugars and carbohydrates
- Altered morphological phenotype
- Male sterility
- Phytoremediation and heavy metal tolerance
- Production of mammalian peptides and vaccines

13

Plant Utility Patent Claims

- Plants
- Plant organs or tissue
- Pollen
- Ovules
- Tissue or cell culture
- Seeds

14

Plant Utility Patent Claims

- Isolated plant polynucleotides and polypeptides
- Isolated plant regulatory elements (e.g. promoter, transcriptional elements)
- Expression cassettes or vectors
- Transgenic plants having a novel phenotype
- Products produced from transgenic plants

15

Plant Utility Patent Claims

- Methods of breeding novel/nonobvious plants using traditional methods
- Methods of molecular plant breeding
- Methods of producing a transgenic plant having a novel phenotype
- Novel plant transformation methods
- Methods of plant cell and tissue culture

16

Plant Utility Patent Representative Claims

Claim 1. Seed of plant variety NN deposited as ATCC Accession No. _____.

Claim 2. A plant grown from the seed of Claim 1.

Claim 3. An isolated DNA encoding protein X.

Claim 4. A method of making a transgenic plant having phenotype Y comprising transforming a plant with said DNA of Claim 3.

Claim 5. A transgenic plant produced by the method of Claim 4.

17

Basic Patentability Standards

- 35 USC § 101, Utility
- 35 USC § 102, Anticipation (Novelty)
- 35 USC § 103, Obviousness
- 35 USC § 112, 1st Paragraph, Written Description
- 35 USC § 112, 1st Paragraph, Enablement
- 35 USC § 112, 2nd Paragraph, Definiteness

18

Utility: 35 U.S.C. § 101

- A patent application must set forth a utility that is:
  - Specific
    - Utility specific to the subject matter claimed as opposed to a general utility to a broad class of inventions
  - Substantial
    - Utility that defines a "real world" use
  - Credible
    - Reliability of the statement based on the logic and facts that are offered by the applicant to support the assertion of utility

19

Anticipation/Novelty

- 35 U.S.C. § 102

  Generally, a person shall be entitled to a patent unless:
  - the invention was known or used by others in the U.S.
  - patented or described in a printed publication in U.S. or a foreign country
  - in public use or on sale in the U.S. more than one year prior to the date of the application

20

Anticipation: 35 USC § 102

- Does the prior art teach a plant variety with the same characteristics?
- Does the prior art teach an isolated DNA as claimed?
- Does the prior art teach a method of making a transgenic plant comprising the isolated DNA as claimed?
- Largely dependent on the breadth of the claims

21

Non-Obviousness 35 U.S.C. § 103

- Are the characteristics of the claimed plant variety obvious over a prior art variety when grown under different conditions?
- Are the characteristics obvious morphological variants?
- Is the claimed DNA suggested by the prior art?
- If so, is there motivation to produce a transgenic plant comprising the DNA?
- Is there an expectation of success in obtaining a transgenic plant with phenotype Y?

22

Written Description
35 USC § 112, 1st Paragraph

The specification shall contain a written description of the invention and of the manner and process of making and using it, in such full, clear, concise, and exact terms . . . any person skilled in the art to which it pertains . . . to make and use the same . . .

23

General Principles

- Basic inquiry: Can one skilled in the art reasonably conclude that the inventor was in possession of the claimed invention at the time the application was filed?
- No new matter may be added to the specification or claims
- The written description requirement is separate and distinct from the enablement requirement.

24

Evidence of Possession

- Reduction to Practice
  - Actual reduction to practice not always required.
  - Deposit of biological materials not a substitute for written description.
- Clear depiction of the claimed invention in detailed drawings.
- What is conventional or well known to one skilled in the art need not be described in detail.

25

Written Description 35 USC § 112, 1st Paragraph

- How many DNAs (species) of the claimed genus are described?
- Are the species that are described representative of the claimed genus?
- Does Applicant describe a structural feature(s) unique to the claimed genus?
- Should generally include structural as well as functional claim language
- Is the phenotype of the transgenic plant described?

26

Enablement
35 USC § 112, 1st Paragraph

The specification shall contain a written description of the invention and of the manner and process of making and using it, in such full, clear, concise, and exact terms . . . any person skilled in the art to which it pertains . . . to make and use the same . . .

27

Enablement
35 USC § 112, 1st Paragraph

Basic Inquiry: Can one skilled in the art make and use the invention without undue experimentation

28

Enablement
35 USC § 112, 1st Paragraph

- Has Applicant taught how to use the claimed plant variety, *i.e.* its agronomically useful phenotypic characteristics?
- Has Applicant taught how to use the claimed DNA?
- Has Applicant taught isolated DNAs?
  - How many DNAs has Applicant isolated?
  - Has Applicant provided specific guidance for isolation of other functionally related DNAs, including structurally unrelated DNAs?
- Should generally include structural as well as functional claim language.

29

Enablement
35 USC § 112, 1st Paragraph

- If the DNA is not enabled throughout the scope of the claim, the method of making a transgenic plant is not enabled throughout the scope of the claim.
- Has Applicant provided guidance for making a transgenic plant having phenotype Y?
- Have related genes resulted in phenotype Y upon expression in plants?

30

Definiteness
35 USC § 112, 2nd Paragraph

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

31

Definiteness
35 USC § 112, 2nd Paragraph

- Lack of antecedent basis
- Metes and bounds not defined
- Lack of clarity
- Terminology contrary to art-recognized definitions
- Lacking an essential step

32

Utility v. Plant Patents

Requirement or Attribute	Utility Patent (35 U.S.C. 111)	Plant Patent (35 U.S.C. 161)
Generic claim or protection possible	Yes	No – patent covers a single plant and its clones
Method claims permitted	Yes	No
Number and format of claims limited	No	Yes – one claim of prescribed format

33

Utility v. Plant Patents

Requirement or Attribute	Utility Patent (35 U.S.C. 111)	Plant Patent (35 U.S.C. 161)
Exclusions	Products of nature	Products of nature, edible tuber-propagated plants
New matter	No	New information may be added as long as it is drawn to the same plant as claimed
Invention must be novel, non-obvious	Yes	Yes

34

Utility v. Plant Patents

Requirement or Attribute	Utility Patent (35 U.S.C. 111)	Plant Patent (35 U.S.C. 161)
Invention must be "enabled"	Yes	No
Deposit of biological material required	If not enabled by being Known & Readily Available	No
Variety name required	No	Yes

35

Utility v. Plant Patents

An invention may support both a utility patent and a plant patent, so long as the subject matter protected by the two patents is not identical.

36

Utility v. Plant Patents

- Utility Patent- may be useful where invention is not limited to a particular variety or where method claims are desired
- Plant Patent- may be useful where it is difficult to meet the written description or enablement requirements of a utility patent

37

Right to Priority

- MPEP1613 Right of Priority Based upon Application for Plant Breeder's Rights
  - Pursuant to 35 U.S.C. 119(f), an application for a patent may rely upon an application for plant breeder's rights filed in a WTO member country (or in a foreign UPOV Contracting Party) for priority under 35 U.S.C. 119(a) through (c).

38

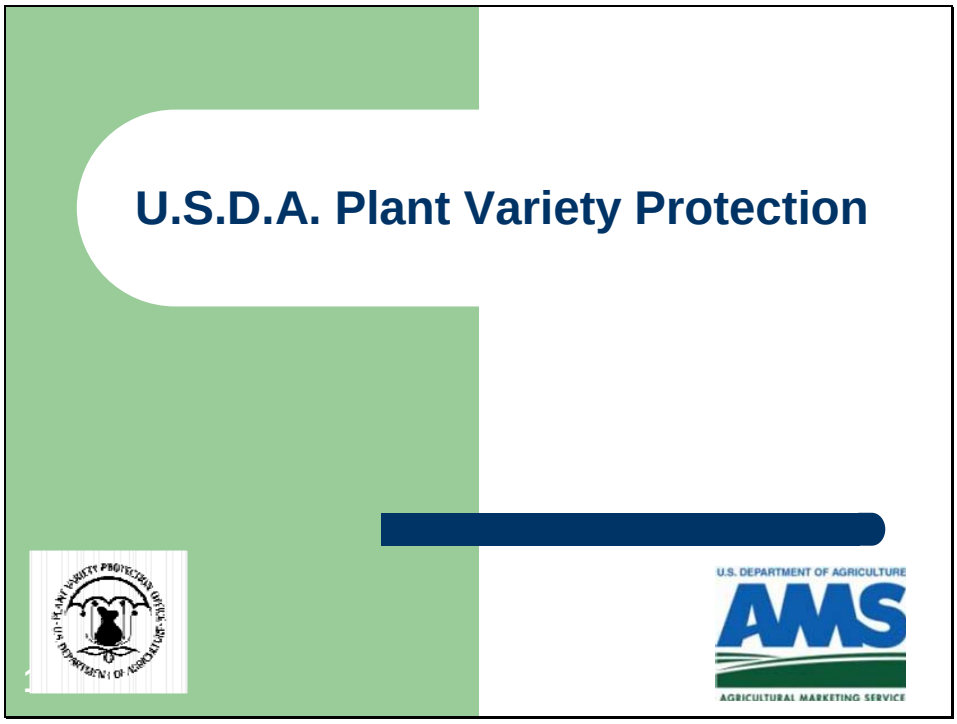
Thanks

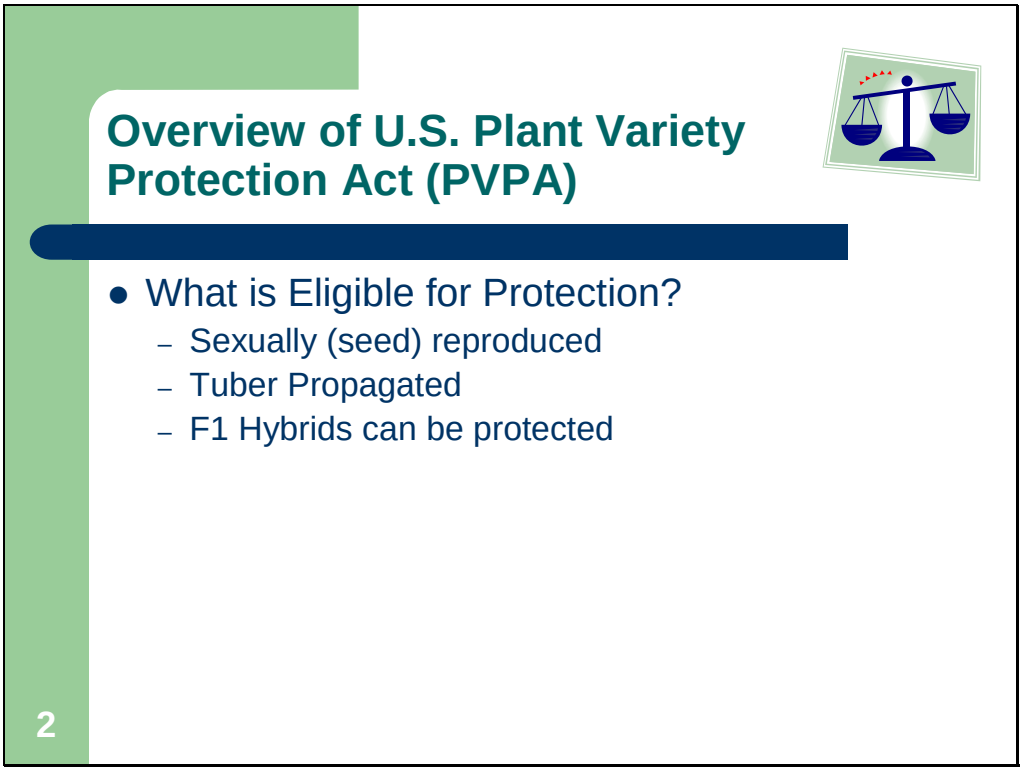
- 1638
  - Stuart Baum
  - Phuong Bui
  - Cynthia Collins
  - David Fox
  - Eileen O'Hara
  - Medina Ibrahim
  - Russell Kallis
  - David Kruse
  - Ann Kubelik
  - Vinod Kumar
  - Beth McElwain
  - Ashwin Mehta
  - Brent Page
  - Keith Robinson
  - Cathy Worley
  - Li Zheng
- 1661
  - Kent Bell
  - Wendy Haas
  - June Hwu
  - Louanne Krawczewicz-Myers
  - Howard Locker
  - Susan McCormick-Ewoldt
  - Annette Para

39

Presentation made by

Paul M. Zankowski, Commissioner, Plant Variety Protection Office,
United States Department of Agriculture (USDA)





To Be Eligible for PVP 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)

3

PVP Application Packet

- Application
  - S&T 470 form – 2 sided
  - A. Breeding History – attest to uniformity and stability
  - B. Distinctness Statement – supporting evidence
  - C. Objective Description of Variety
  - D. Additional Description (optional)
  - E. Basis of Ownership
- Seeds
  - 3,000 Seeds, >85% germination, untreated
- Fees
  - Total Current Fees for PVP Certificate:
    - $518 (Filing Fee) + $3,864 (Search/Examination Fee) with the Application
    - $768 (Certificate Fee) - when issuance is allowed
    - TOTAL = $5,150

4

PVP Application Exhibit A

How bred, OR discovered and developed

Includes:

1. Name of genetically-related starting materials, back to public or commercial lines
2. Method(s) used, steps taken, dates
3. Criteria used for selection
4. Evidence of Uniformity and Stability
5. Variant description and frequency (genetic variants; less than 5%)

5

PVP Application Exhibit B

Establishes the Distinctness of the variety

General Format:

1. Name the MOST SIMILAR comparison varieties
2. State traits and values to distinguish
3. Provide evidence:
   - ✓ Differences are clear, uniform, stable
   - ✓ 2-3 generations of statistical evidence
   - ✓ Color chart readings

6

PVP Application
Supporting Evidence

- Colors : verbal descriptions and color charts
- Shapes: verbal descriptions and photographs
- Quantitative differences: descriptive statistics and statistical analysis, replicated trials
- Diseases: disease ratings, replicated trials with resistant and susceptible comparisons
- Lab Tests: published procedures, publicly available reagents

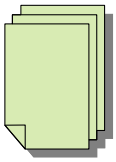
7

PVP Application
Exhibit C – Variety Objection Description

- Describes the variety based on standard agronomic, physiological, biochemical, and morphological characters
- Example – Rice
  1. Maturity: Days to Heading
  2. Culm angle and length
  3. Flag leaf, Ligule, and Panicle length and morphology
  4. Grain (spikelet and seed) morphology and color
  5. Resistance to Low Temperature
  6. Seedling vigor not related to low temperature
  7. Rice blast resistance
  8. Resistance to other diseases and insects

8

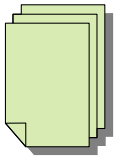
PVP Application Exhibit D



- Optional
- Includes data not otherwise reported within the application
- Examples:
  - Isozyme analysis
  - RFLP, SSRs, or other genetic fingerprinting techniques
  - Combining ability
  - Extensive statistical tables or supporting evidence

9

PVP Application Exhibit E



- ✓ State the basis of ownership
- ✓ Explain whether the owner is eligible to apply
- ✓ State whether any other person or company has had ownership or retains rights to the variety

10

PVP Application Flow Process

- Examiner determines:
  - ✓ if application is complete, fees paid, eligibility requirements met, if variety is new, uniform, stable, and distinct
- Quality Assurance Review
- Commissioner
  - ✓ verifies finding of examiner
  - ✓ requests certificate issuance fee
  - ✓ signs certificate
- Secretary of Agriculture
  - ✓ signs certificate

11

PVP Certificate Issued

12

PVP Rights Granted

Can exclude others from:

- Selling or marketing the variety
- Conditioning or stocking the variety
- Offering it for sale or reproducing it
- Importing or exporting it
- Using the variety to produce (as distinguished from develop) a hybrid or different variety
- May opt to sell the variety only as a class of certified seed (if chosen, this option cannot be reversed)
- Certificate holder has these rights for 20 years (25 years for trees or vines) from issuance of the certificate

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PVP Exemptions

- Farmers Exemption: Save for use of farm but NO transfer to others for reproductive purposes
- Research Exemption: Others can use the variety in plant breeding or other research

14

PVP Certificate Holder Responsibilities

- ✓ Replenish seed sample when requested
- ✓ Inform the PVP Office of changes in name and/or address of the certificate holder or contact person
- ✓ Use variety name, even after certificate expires
- ✓ Include the version of PVP Act on labels
- ✓ Notify the public that the variety is protected using appropriate language

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PVP Protest Proceedings, Priority Contests, and Appeals

- Protest – opposition by any person to the granting of PVP while the application is pending and within the first 5 years following issuance
- Priority Contest – When the same variety is independently developed by different parties, the right of priority for a certificate of protection is determined by filing date. Prior to amendment of the PVP Act in 1994, the right of priority was controlled by the date of determination of the variety.
- Reconsideration / Appeal to the Commissioner – reconsideration following an adverse action by a PVP examiner
- Appeal to Secretary – reconsideration to the Secretary following a denial by the Commissioner

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Overall PVP Statistics
(since 1970 as 2/03/2009)

Total Applications Received	9,675
Total Certificates Issued	7,276 (75% of all received)
Certificates in force	4,825 (66% of all issued)
Total applications not issued (abandoned, withdrawn, denied)	1,467 (15% of all received)
Certificates in process of issuing	119
Total applications pending final action	813

17

PVP Application Throughput Goals

	FY06	FY07	FY08	FY09 Est
Backlog – Beginning of Year	716	735	809	767
New applications received	304	455	412	400
Certificates issued or recommended	239	362	402	400
Applications abandoned	84	44	52	50
Year End Backlog	735	809	767	717

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Incoming PVP Applications - Top 10 Crops

FY2007		FY2008	
Corn	100	Corn	110
Soybean	68	Soybean	55
Cotton	53	Wheat	48
Wheat	45	Lettuce	28
Lettuce	29	Kentucky Bluegrass	25
Ryegrass	29	Potato	15
Beans	20	Cotton	12
Potato	11	Ryegrass	10
Zinnia	11	Oat	9
Pea	9	Peanut	9
Others	80	Others	91
Total	455	Total	412

19

PVPO Staff

1 Commissioner
7 PVP Examiners
2 Information Technology Specialist
2 PVP Program Analysts
1 PVP Associate Examiner
3 Student Interns

Current Total = 15 Full Time

20

[Annex III follows]

ANNEX III

Presentation made by

Mr. Gary Kinard, National Germplasm Resources Laboratory,
Beltsville National Agricultural Research Center, Agricultural Research Service,
U.S. Department of Agriculture

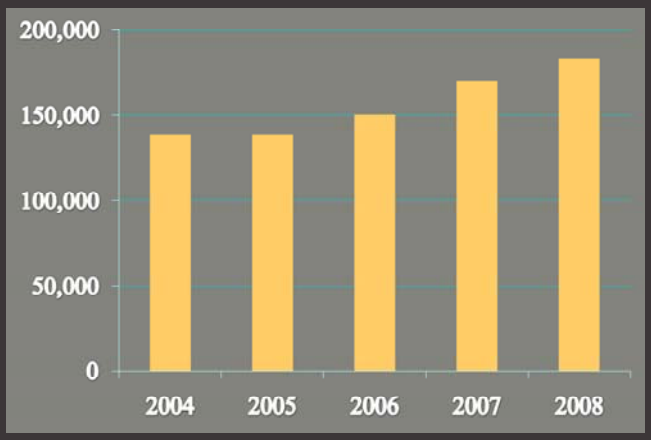
NPGS

- About 510,000 accessions
- >2,100 genera
- >13,000 species
- All genetic resources in NPGS considered a global asset
- Freely available to all qualified researchers

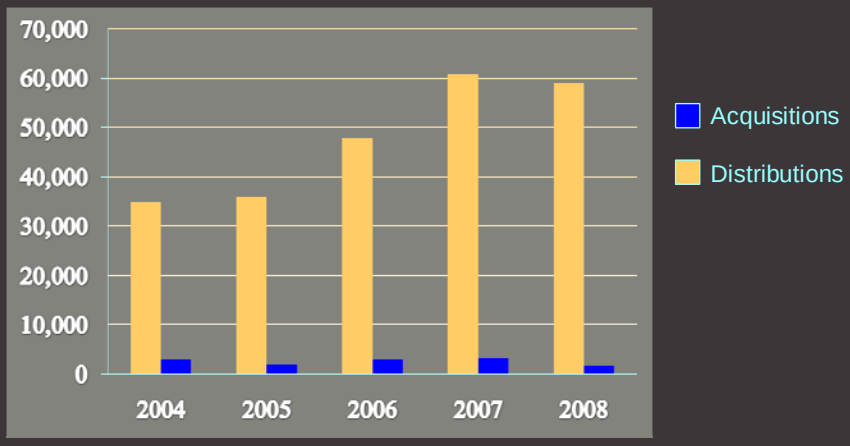
The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

- Signed by US government in 2002
- Awaiting action by US Senate
- The NPGS is accepting material accompanied by the IT SMTA

Total NPGS Distributions 2004 - 2008



NPGS Foreign Acquisitions and Distributions 2004 - 2008



NGRL is a laboratory that delivers essential core services to the entire NPGS through 3 Units:

1. Database Management Unit
2. Plant Exchange Office
3. Plant Disease Research Unit

NGRL is a laboratory that delivers essential core services to the entire NPGS through 3 Units:

1. **Database Management Unit**
2. Plant Exchange Office
3. Plant Disease Research Unit

Database Management Unit (DBMU)

The data input and retrieval system

Germplasm Resources Information Network

GRIN

http://www.ars-grin.gov

Database Management Unit (DBMU)

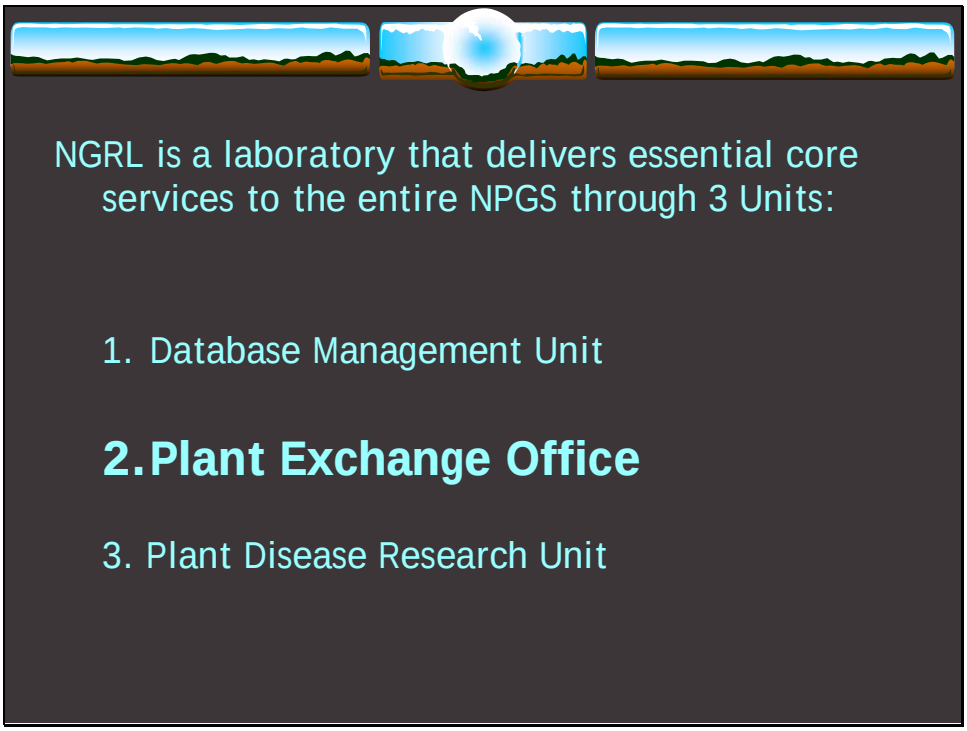
GRIN is an automated data retrieval system for the collection and dissemination of germplasm information.

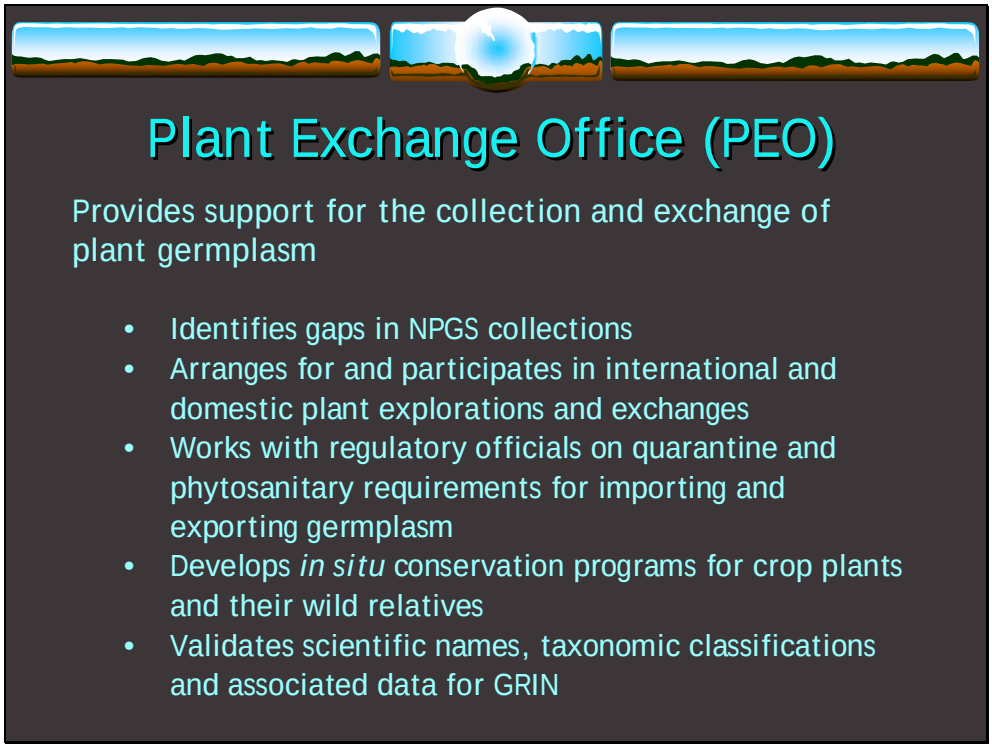
GRIN Statistics

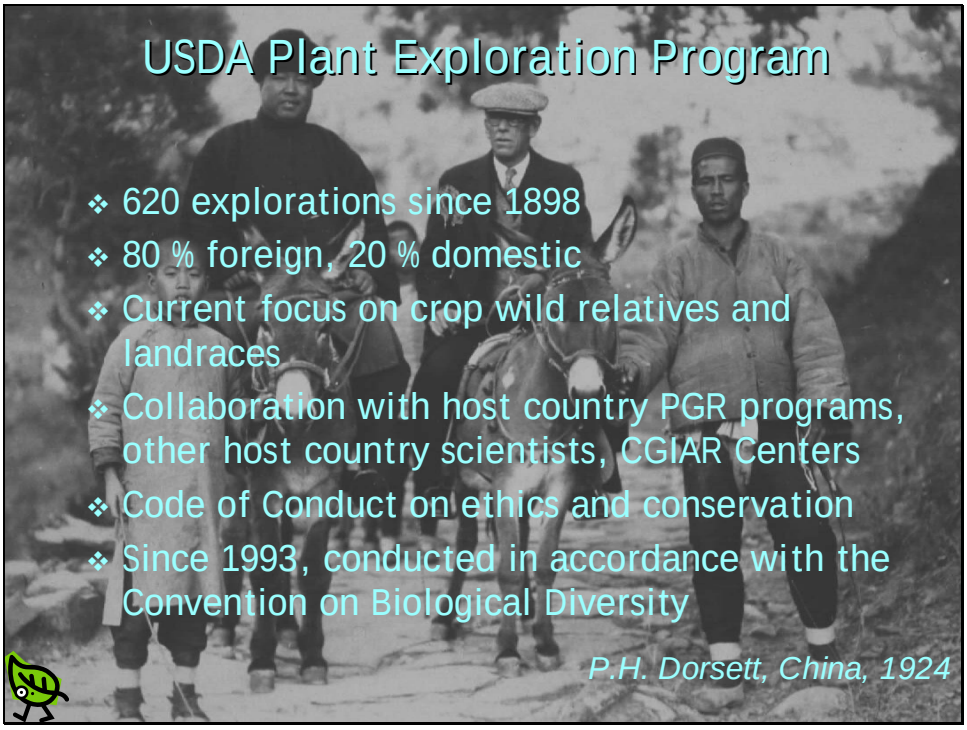
- Currently maintains data on > 510,000 active NPGS accessions
- 24/7/365 availability with <2% down time
- Shopping cart feature allows for free of charge ordering of germplasm for bona fide purposes
- 42 Crop Germplasm Committees (CGCs) advise the NPGS on priorities for that crop

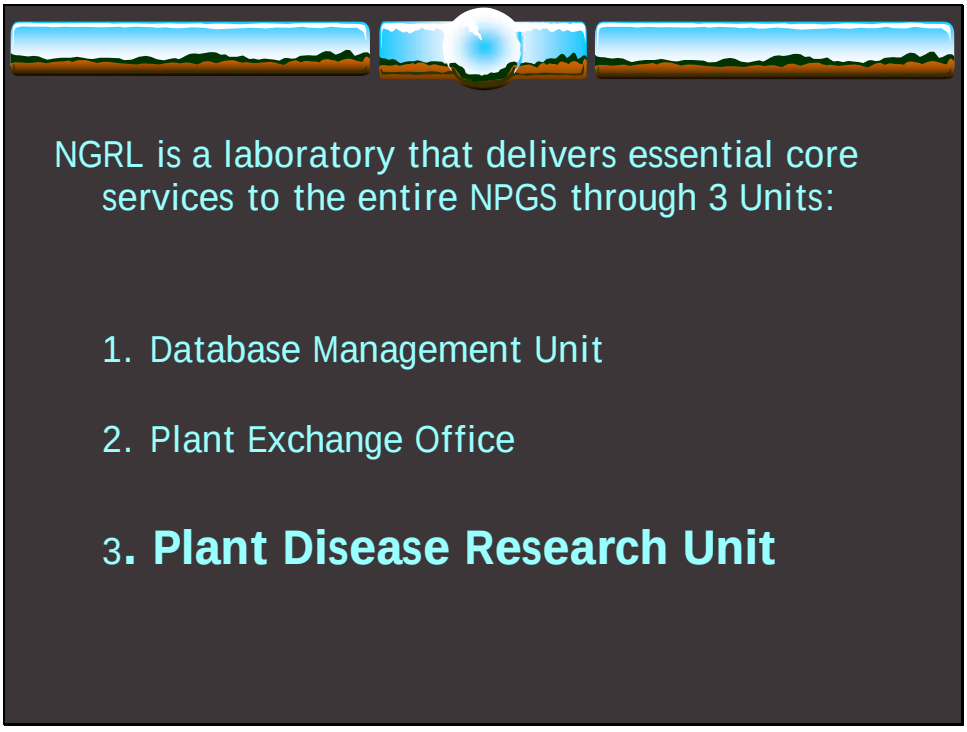
GRIN-Taxonomy

- Dr. John Wiersema
- Provides taxonomic, nomenclature, geographic, and economic use data on more than 55,000 species and infraspecies of agroeconomically important plants
- Includes links to NPGS inventory
- Includes state and federal regulated noxious weeds, and federally and internationally listed threatened and endangered plants
- Is Google indexed


NGRL is a laboratory that delivers essential core services to the entire NPGS through 3 Units:
1. Database Management Unit
2. Plant Exchange Office
3. Plant Disease Research Unit


Plant Exchange Office (PEO)
Provides support for the collection and exchange of plant germplasm
• Identifies gaps in NPGS collections
• Arranges for and participates in international and domestic plant explorations and exchanges
• Works with regulatory officials on quarantine and phytosanitary requirements for importing and exporting germplasm
• Develops *in situ* conservation programs for crop plants and their wild relatives
• Validates scientific names, taxonomic classifications and associated data for GRIN

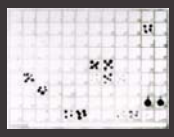

USDA Plant Exploration Program
620 explorations since 1898
80 % foreign, 20 % domestic
Current focus on crop wild relatives and landraces
Collaboration with host country PGR programs, other host country scientists, CGIAR Centers
Code of Conduct on ethics and conservation
Since 1993, conducted in accordance with the Convention on Biological Diversity
P.H. Dorsett, China, 1924


NGRL is a laboratory that delivers essential core services to the entire NPGS through 3 Units:
1. Database Management Unit
2. Plant Exchange Office
3. Plant Disease Research Unit

Plant Disease Research Unit (PDRU)

Provides support for the USDA quarantine system by conducting research that improves the quarantine process.

- Etiology/Characterization
- Detection
- Elimination



of pathogens that could gain entry into the U.S. via imported germplasm and threaten domestic industries and ecosystems.

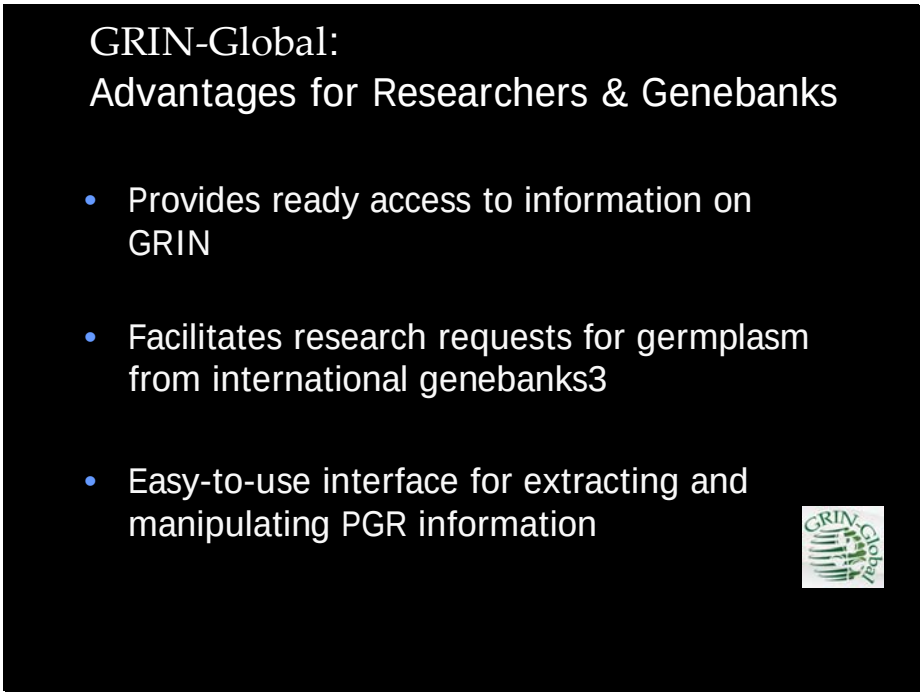
Thank You!

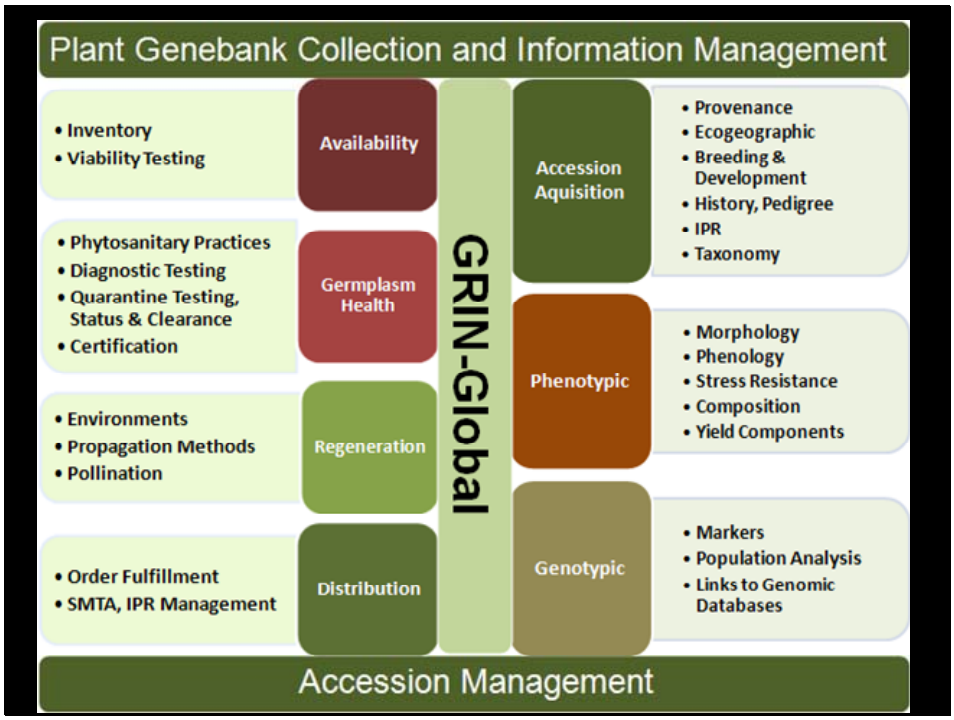
Diversity

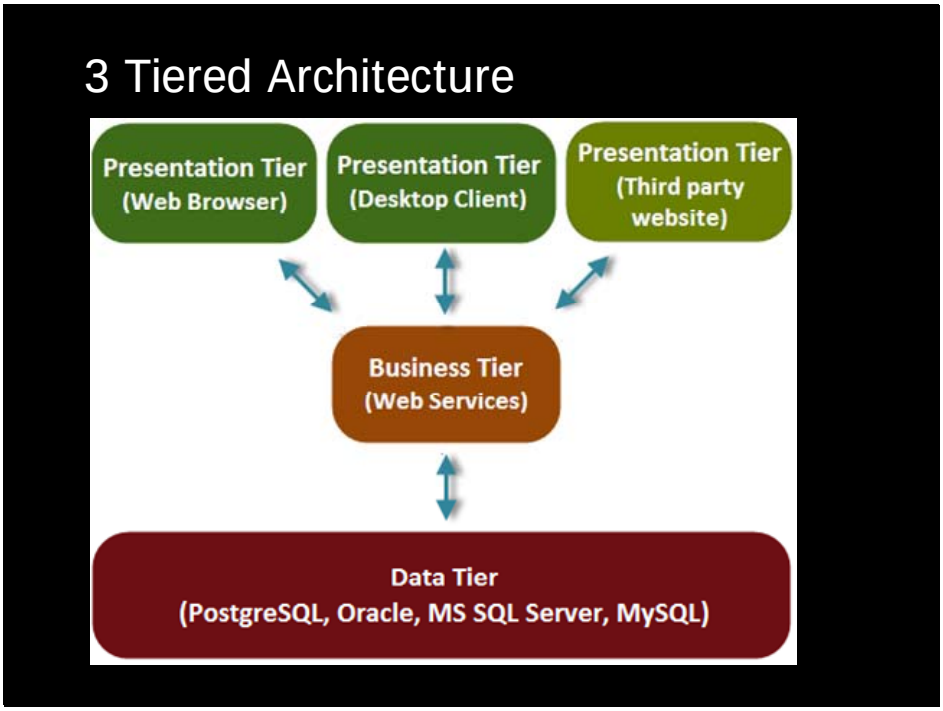
National Germplasm Resources Laboratory

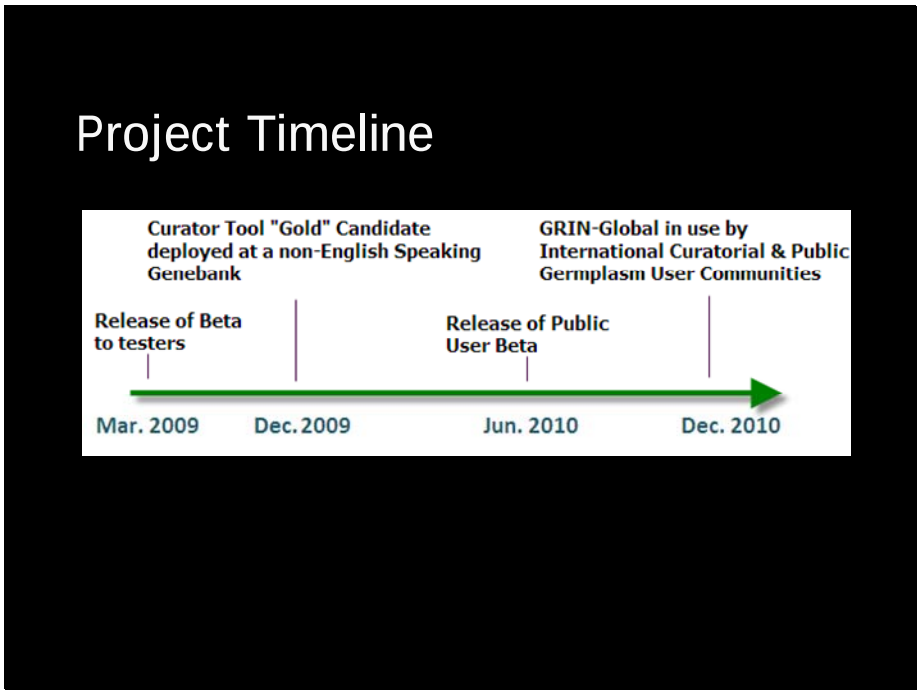
Presentation made by

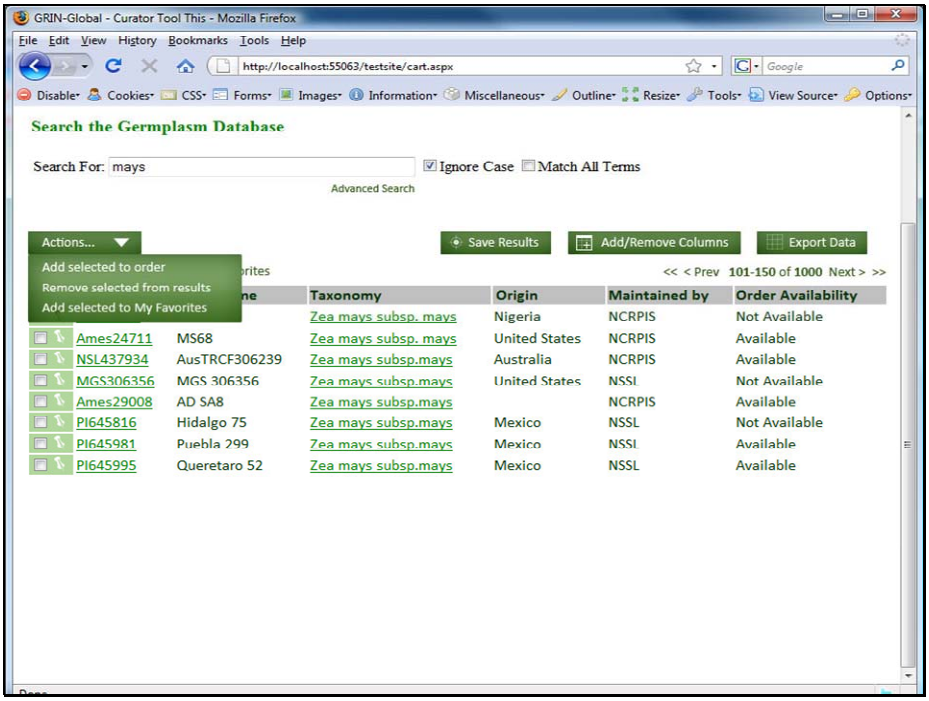
Experts from the National Germplasm Resources Laboratory,
Beltsville National Agricultural Research Center, Agricultural Research Service,
U.S. Department of Agriculture

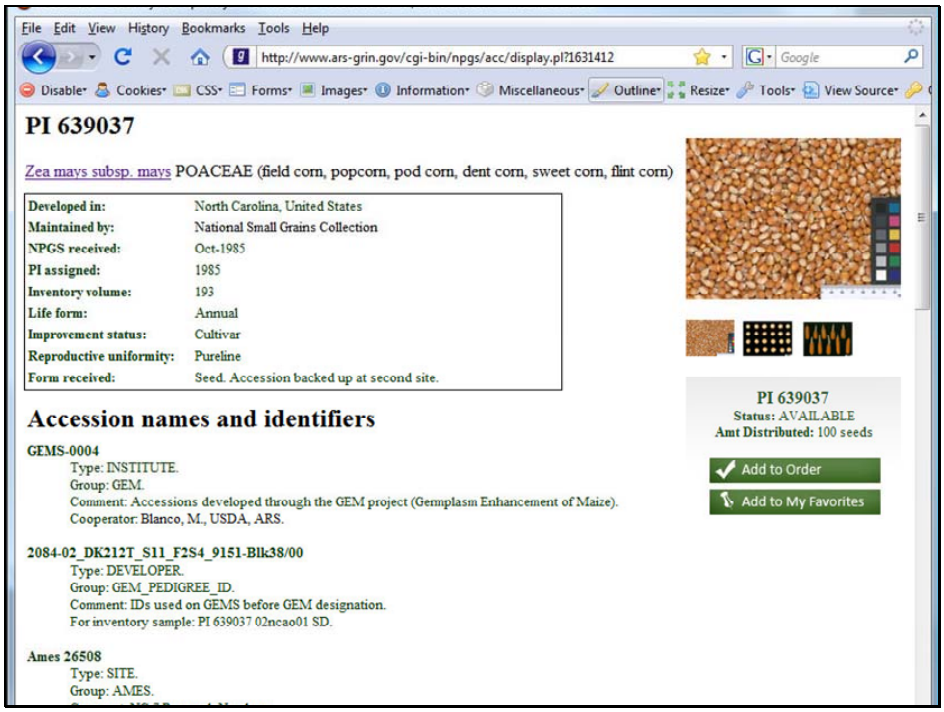


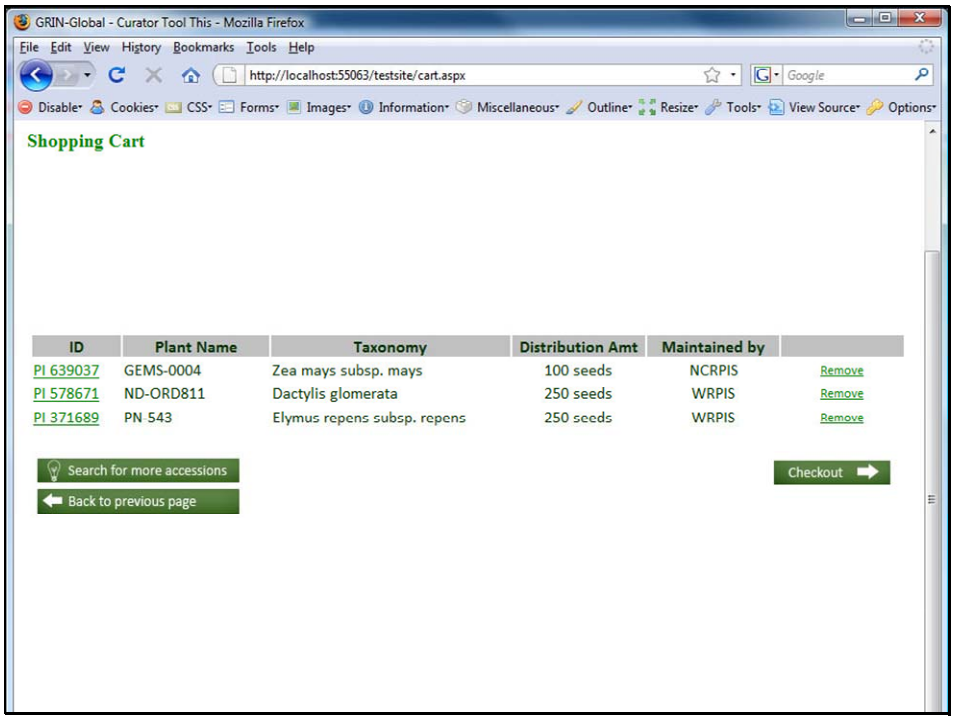

Plant Genebank Collection and Information Management
• Inventory
• Viability Testing
Availability
• Phytosanitary Practices
• Diagnostic Testing
• Quarantine Testing, Status & Clearance
• Certification
Germplasm Health
• Environments
• Propagation Methods
• Pollination
Regeneration
• Order Fulfillment
• SMTA, IPR Management
Distribution
GRIN-Global
Accession Aquisition
• Provenance
• Ecogeographic
• Breeding & Development
• History, Pedigree
• IPR
• Taxonomy
Phenotypic
• Morphology
• Phenology
• Stress Resistance
• Composition
• Yield Components
Genotypic
• Markers
• Population Analysis
• Links to Genomic Databases
Accession Management

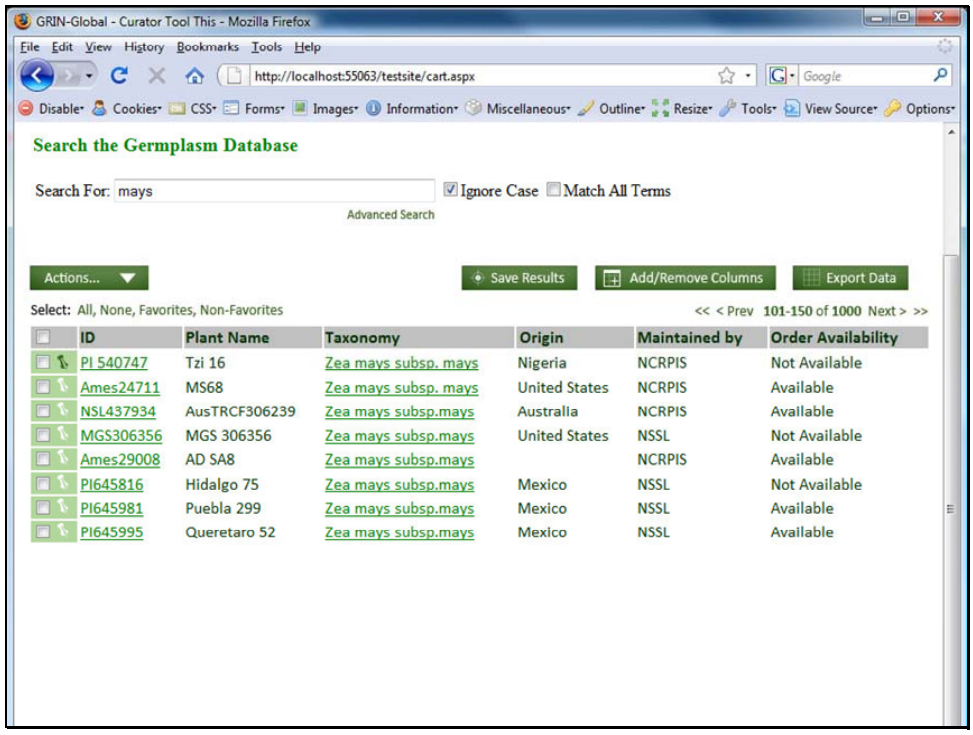

3 Tiered Architecture
Presentation Tier (Web Browser)
Presentation Tier (Desktop Client)
Presentation Tier (Third party website)
Business Tier (Web Services)
Data Tier
(PostgreSQL, Oracle, MS SQL Server, MySQL)


Project Timeline
Curator Tool "Gold" Candidate deployed at a non-English Speaking Genebank
GRIN-Global in use by International Curatorial & Public Germplasm User Communities
Release of Beta to testers
Release of Public User Beta
Mar. 2009
Dec. 2009
Jun. 2010
Dec. 2010


GRIN-Global - Curator Tool This - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:55063/testsite/cart.aspx
Search the Germplasm Database
Search For: mays
Ignore Case
Match All Terms
Advanced Search
Actions...
Add selected to order
Remove selected from results
Add selected to My Favorites
Save Results
Add/Remove Columns
Export Data
<< < Prev 101-150 of 1000 Next > >>
Taxonomy
Origin
Maintained by
Order Availability
Zea mays subsp. mays Nigeria NCRPIS Not Available
Ames24711 MS68 Zea mays subsp. mays United States NCRPIS Available
NSL437934 AusTRCF306239 Zea mays subsp.mays Australia NCRPIS Available
MGS306356 MGS 306356 Zea mays subsp.mays United States NSSL Not Available
Ames29008 AD SA8 Zea mays subsp.mays NCRPIS Available
PI645816 Hidalgo 75 Zea mays subsp.mays Mexico NSSL Not Available
PI645981 Puebla 299 Zea mays subsp.mays Mexico NSSL Available
PI645995 Queretaro 52 Zea mays subsp.mays Mexico NSSL Available


File Edit View History Bookmarks Tools Help
http://www.ars-grin.gov/cgi-bin/npgs/acc/display.pl?1631412
PI 639037
Zea mays subsp. mays POACEAE (field corn, popcorn, pod corn, dent corn, sweet corn, flint corn)
Developed in: North Carolina, United States
Maintained by: National Small Grains Collection
NPGS received: Oct-1985
PI assigned: 1985
Inventory volume: 193
Life form: Annual
Improvement status: Cultivar
Reproductive uniformity: Pureline
Form received: Seed. Accession backed up at second site.
Accession names and identifiers
GEMS-0004
Type: INSTITUTE.
Group: GEM.
Comment: Accessions developed through the GEM project (Germplasm Enhancement of Maize).
Cooperator: Blanco, M., USDA, ARS.
2084-02_DK212T_S11_F2S4_9151-Blk38/00
Type: DEVELOPER.
Group: GEM_PEDIGREE_ID.
Comment: IDs used on GEMS before GEM designation.
For inventory sample: PI 639037 02ncao01 SD.
Ames 26508
Type: SITE.
Group: AMES.
PI 639037
Status: AVAILABLE
Amt Distributed: 100 seeds
Add to Order
Add to My Favorites


GRIN-Global - Curator Tool This - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:55063/testsite/cart.aspx
Shopping Cart
ID Plant Name Taxonomy Distribution Amt Maintained by
PI 639037 GEMS-0004 Zea mays subsp. mays 100 seeds NCRPIS Remove
PI 578671 ND-ORD811 Dactylis glomerata 250 seeds WRPIS Remove
PI 371689 PN-543 Elymus repens subsp. repens 250 seeds WRPIS Remove
Search for more accessions
Back to previous page
Checkout



[End of Annex III and of document]