U.S. Plant Variety Protection Office

Use of Variety Descriptions Provided by Breeders –

Experience in the United States of America (Revised)

Types of Protection in the USA

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

U.S. PVP Key Distinctions

- PVPA
  - 7 U.S.C. 2327
  - Dept. of Agriculture / AMS
- Requirements
  - New (may be obvious), distinct, uniform (based on commercial standards for the crop), and stable
  - Must be bred, or, discovered and developed
  - Plants must be sexually reproducible
- Definition of Novelty
  - One year of first sale in USA; or four years of first sale in another UPOV country
- Claims
  - Single variety only may be claimed
- Enforcement
  - Litigation rarely required
- Extent of Protection
  - An owner has the right to exclude others from selling or marketing; conditioning for sale, reproducing; importing or exporting; or using the variety to produce a hybrid. Only the variety disclosed (and essentially-derived varieties) is protected.

PVP Application

- 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
  - F. Declaration of seed deposit
- Seeds
  - 3,000 Seeds, >85% germination, untreated - provided to the office within 3 months of filing or before certificate issuance (whichever is first)
- 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

Exhibit A: Breeding History

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%)

The applicant is required to provide:

1. A full disclosure of the genealogy back to publicly known varieties, lines, or clones, including the breeding method;
2. The details of subsequent stages of selection and multiplication used to develop the variety;
3. A statement of uniformity reporting the level of variability in any characteristics of the variety (commercially acceptable variability is allowed);
4. A statement of genetic stability showing the number of cycles of seed reproduction for which the variety has remained unchanged in all distinguishing characteristics;
5. The type and frequency of genetic variants observed during reproduction and multiplication

Exhibit B: Statement of Distinctness

Establishes the Distinctness of the variety

General Format:

1. Name the MOST SIMILAR comparison variety or 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
   - ✓ prefer one year of testing in the U.S.

Supporting Evidence

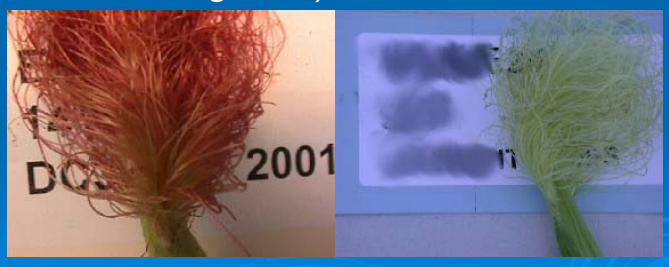
- Colors : verbal descriptions and color charts
- Shapes: verbal descriptions and photographs
- Quantitative differences: descriptive statistics and statistical analysis, replicated trials
- Diseases: disease ratings, replicated trials with resistant and susceptible comparisons
- Lab Tests: published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

Evidence for Flower Color Difference

'FL 1922' is most similar to 'Norchip'; however, 'FL 1922' has purple flower color, whereas 'Norchip' has white flower color (90B vs. 155A of the Royal Horticultural Society Color Chart, respectively). (Figure 2).

Evidence for Silk Color Difference

Variety PH5W4 has primarily a pink silk influenced somewhat by sunlight (10RP 4/8) vs. PHHB9, which has primarily a yellow silk color (2.5Y 8.5/4; Figure 1).



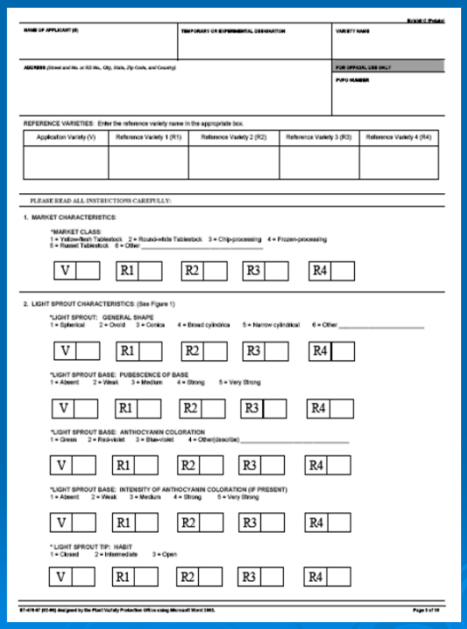
Evidence for Quantitative Difference

'PHBAB‘ differs from 'PH1W2' in leaf length (67 vs. 82 cm) and tassel branch angle (30 vs. 14 degrees).

Summary data from three locations in 2002	PHBAB	PH1W2	DF	t-Value (pooled)	Prob Value (2-tail, pooled)
Leaf Length (cm)	66.7 +/- 2.35 (n=15)	81.9 +/- 4.09 (n=15)	28	-12.5	0.000
Tassel Branch Angle (degrees)	30.3 +/- 7.25 (n=15)	13.7 +/- 4.70 (n=15)	28	7.4	0.000

Exhibit C

- Botanical description of the variety
- Crop-specific forms created by PVP Office
- Entered into crop database
- Used to:
  - ✓ Describe the “invention”
  - ✓ Confirm distinctness



NAME OF APPLICANT (S) | TEMPORARY OR EXPERIMENTAL DESIGNATION | VARIETY NAME

ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country) | FOR OFFICIAL USE ONLY | PVPO NUMBER

REFERENCE VARIETIES: Enter the reference variety name in the appropriate box.

Application Variety (V)	Reference Variety 1 (R1)	Reference Variety 2 (R2)	Reference Variety 3 (R3)	Reference Variety 4 (R4)

PLEASE READ ALL INSTRUCTIONS CAREFULLY:

1. MARKET CHARACTERISTICS

*MARKET CLASS:
1 = Yellow-flesh Tablestock 2 = Round-white Tablestock 3 = Chip-processing 4 = Frozen-processing
5 = Russet Tablestock 6 = Other_____

V ☐ R1 ☐ R2 ☐ R3 ☐ R4 ☐

2. LIGHT SPROUT CHARACTERISTICS (See Figure 1)

*LIGHT SPROUT: GENERAL SHAPE
1 = Spherical 2 = Ovoid 3 = Conica 4 = Broad cylindrica 5 = Narrow cylindrical 6 = Other_____

V ☐ R1 ☐ R2 ☐ R3 ☐ R4 ☐

*LIGHT SPROUT BASE: PUBESCENCE OF BASE
1 = Absent 2 = Weak 3 = Medium 4 = Strong 5 = Very Strong

V ☐ R1 ☐ R2 ☐ R3 ☐ R4 ☐

*LIGHT SPROUT BASE: ANTHOCYANIN COLORATION
1 = Green 2 = Red-violet 3 = Blue-violet 4 = Other(describe)_____

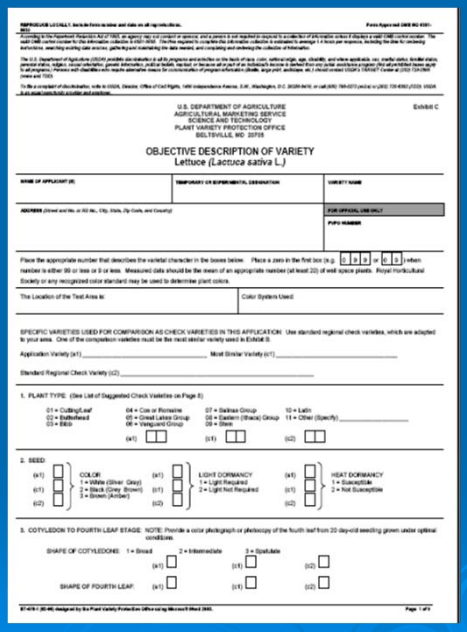
V ☐ R1 ☐ R2 ☐ R3 ☐ R4 ☐

*LIGHT SPROUT BASE: INTENSITY OF ANTHOCYANIN COLORATION (IF PRESENT)
1 = Absent 2 = Weak 3 = Medium 4 = Strong 5 = Very Strong

V ☐ R1 ☐ R2 ☐ R3 ☐ R4 ☐

* LIGHT SPROUT TIP: HABIT
1 = Closed 2 = Intermediate 3 = Open

V ☐ R1 ☐ R2 ☐ R3 ☐ R4 ☐



REPRODUCE LOCALLY. Include forms in letter and data on all reproductions. Form Approved OMB NO. 0581-

Exhibit C

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

OBJECTIVE DESCRIPTION OF VARIETY
Lettuce (*Lactuca sativa* L.)

NAME OF APPLICANT (S) | TEMPORARY OR EXPERIMENTAL DESIGNATION | VARIETY NAME

ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country) | FOR OFFICIAL USE ONLY | PVPO NUMBER

Place the appropriate number that describes the varietal character in the boxes below. Place a zero in the first box (e.g. 0 9 or 0 5) when number is either 99 or less or 9 or less. Measured data should be the mean of an appropriate number (at least 20) of well spaced plants. Royal Horticultural Society or any recognized color standard may be used to determine plant colors.

The Location of the Test Area is: | Color System Used:

SPECIFIC VARIETIES USED FOR COMPARISON AS CHECK VARIETIES IN THIS APPLICATION: Use standard regional check varieties, which are adapted to your area. One of the comparison varieties must be the most similar variety used in Exhibit B.

Application Variety (e1)_____ Most Similar Variety (e1)_____

Standard Regional Check Variety (c2)_____

1. PLANT TYPE (See List of Suggested Check Varieties on Page 8)

01 = Cutting/Leaf 04 = Cos or Romaine 07 = Batlisa Group 10 = Latin
02 = Butterhead 05 = Great Lakes Group 08 = Eastern (Ithaca) Group 11 = Other (Specify)_____
03 = Stem 06 = Vanguard Group 09 = Stem

(e1) ☐☐ (c1) ☐☐ (c2) ☐☐

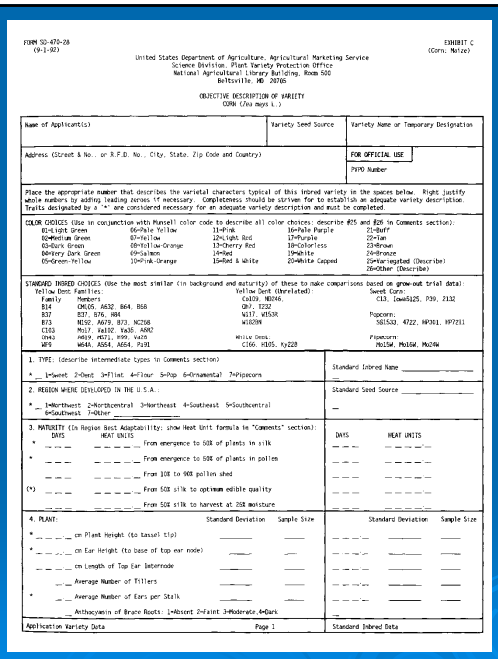
2. SEED:

COLOR (e1) (c1) (c2): 1 = White (Silver Gray) 2 = Black (Grey Brown) 3 = Brown (Amber)
LIGHT DORMANCY (e1) (c1) (c2): 1 = Light Required 2 = Light Not Required
HEAT DORMANCY (e1) (c1) (c2): 1 = Susceptible 2 = Not Susceptible

3. COTYLEDON TO FOURTH LEAF STAGE: NOTE: Provide a color photograph or photocopy of the fourth leaf from 20 day-old seedling grown under optimal conditions.

SHAPE OF COTYLEDONS: 1 = Broad 2 = Intermediate 3 = Spatulate
(e1) ☐ (c1) ☐ (c2) ☐

SHAPE OF FOURTH LEAF: (e1) ☐ (c1) ☐ (c2) ☐



FORM SD-470-28 (9-1-92)

EXHIBIT C (Corn: Maize)

United States Department of Agriculture, Agricultural Marketing Service
Science Division, Plant Variety Protection Office
National Agricultural Library Building, Room 500
Beltsville, MD 20705

OBJECTIVE DESCRIPTION OF VARIETY
CORN (*Zea mays* L.)

Name of Applicant(s)	Variety Seed Source	Variety Name or Temporary Designation
Address (Street & No., or R.F.D. No., City, State, Zip Code and Country)		FOR OFFICIAL USE PVPO Number

Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a "*" are considered necessary for an adequate variety description and must be completed.

COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices; describe #35 and #36 in Comments section):

01=Light Green, 02=Medium Green, 03=Dark Green, 04=Very Dark Green, 05=Green-Yellow, 06=Pale Yellow, 07=Yellow, 08=Yellow-Orange, 09=Salmon, 10=Pink-Orange, 11=Pink, 12=Light Red, 13=Cherry Red, 14=Red, 15=Red & White, 16=Pale Purple, 17=Purple, 18=Colorless, 19=White, 20=White Capped, 21=Buff, 22=Tan, 23=Brown, 24=Bronze, 25=Variegated (Describe), 26=Other (Describe)

STANDARD INBRED CHOICES (Use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data):

Yellow Dent Families:
Family — Members
B14 — CM105, A632, A64, B68
B37 — B37, B76, H84
B73 — N192, A679, B73, NC258
C103 — Mo17, Va102, Va35, A662
Oh43 — A619, H571, H99, Va26
MF9 — W64A, A554, A654, Pa91

Yellow Dent (Unrelated): Co109, ND246, CR7, ES22, W117, W153R, W182BN

Mixie Dents: C166, H105, Ky228

Sweet Corn: C13, Iowa5125, P39, Z132

Popcorn: SB1532, 4722, HP301, HP7Z11

Pipecorn: Mo15W, Mo18W, Mo20W

1. TYPE: (Describe intermediate types in Comments section) * __ 1=Sweet 2=Dent 3=Flint 4=Flour 5=Pop 6=Ornamental 7=Pipecorn	Standard Inbred Name
2. REGION WHERE DEVELOPED IN THE U.S.A. * __ 1=Northwest 2=Northcentral 3=Northeast 4=Southeast 5=Southcentral 6=Southwest 7=Other	Standard Seed Source

3. MATURITY (In Region Best Adaptability; show Heat Unit formula in "Comments" section):

	DAYS	HEAT UNITS		DAYS	HEAT UNITS
*			From emergence to 50% of plants in silk		
*			From emergence to 50% of plants in pollen		
			From 10% to 90% pollen shed		
(*)			From 50% silk to optimum edible quality		
			From 50% silk to harvest at 25% moisture		

4. PLANT:

	Standard Deviation	Sample Size	Standard Deviation	Sample Size
* ___ cm Plant Height (to tassel tip)				
* ___ cm Ear Height (to base of top ear node)				
___ cm Length of Top Ear Internode				
___ Average Number of Tillers				
* ___ Average Number of Ears per Stalk				
___ Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate,4=Dark				

Application Variety Data — Page 1 — Standard Inbred Data

Crop Database information

- Crop specific
- Used to confirm distinctness of variety
- Contains descriptive information about crop varieties
- Data comes from
  - Exhibit C's
  - Other parts of applications
  - Literature: journals, seed catalogs, release notices, trial reports

PVPO Databases

PVPO Species Databases	Number of Records (Varieties) as of 2/22/2010	PVPO Species Databases	Number of Records
Alfalfa	1,529	Pea	2,733
Barley	2,276	Pepper	1,385
Bean	2,762 (Garden bean), 1,560 (Dry bean)	Potato	2,357
Bluegrass	1,075	Rice	699
Corn	2,928	Ryegrass	2,341
Cotton	2,744	Sorghum	3,447
Fescue	709 (Fine fescue), 966 (tall fescue)	Soybean	3,396
Lettuce	2,572	Tobacco	625
Marigold	655	Tomato	3,189
Oat	1,166	Watermelon	974
Onion	1,714	Wheat	4,021

Search Strategies

- Boolean search logic
- Use search sets – bracketed around the reported value
  - If plant height = 200 cm
  - Then search range might = 180 to 220 cm
- Null value (blank character state) is considered to match everything

PVPO –Database – Comparative Search Example

Examiner Questions

- If the examiner has questions about the character states, variability, distinctness or other issues,
- If specific language needed to establish new, distinct, uniform, and stable is missing,
- then those questions will be sent back to the applicant

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Monsanto Company

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

WHEAT, COMMON

'Whetstone'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the* ***City of Washington, D.C.*** *this ninth day of November, in the year* ***two thousand and nine.***

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

Summation

- Distinctness
- Uniformity
- Stability