



U.S. Plant Variety Protection Office

Use of Variety Descriptions Provided by Breeders – Experience in the United States of America

March 20, 2010

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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.

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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).



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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).



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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

Molecular Techniques

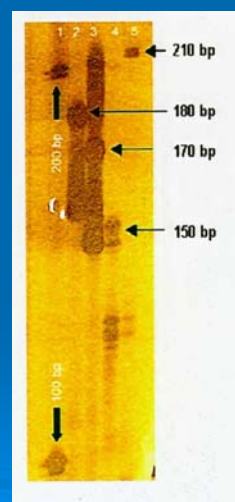
- The PVPO will accept differences using molecular techniques (DNA fingerprinting) only if:
 - the molecular marker locus is publicly disclosed and cited (cites to URLs such as Soybase or MaizeGDB are acceptable);
 - the molecular marker locus is clearly identified;
 - the specific differentiating data is cited;
 - if photographic copies are provided, they contain sufficient resolution of scientific publishable quality gels or other molecular data with sufficient resolution and labeling to resolve the individual data in question are provided;
 - the molecular marker locus can be detected by a third party.

Molecular Markers:

- Must be treated the same as other methods used to establish distinctness (morphology and physiology)
- Must meet the quality controls in place for appropriate supporting evidence
 - For example, when used to establish distinctness, the molecular data must prove that the difference is present in all individuals of the varieties and can be relied upon to prove the distinctness to anyone who performs the tests

Example of Biochemical & Molecular Information Utilized

'Dilse' differs from 'Ben' at microsatellite locus Xgwm193. This marker amplified a fragment of approximately of 170 base pairs from 'Ben' (lane #3) that is not present in 'Dilse' (lane #4). This marker is tightly linked with a high grain protein content gene.



Current PVP Use of Molecular Markers

- Differentiate a new variety from a few older varieties that are retrieved by the computer search
 - Often faster than doing grow-out trials to establish morphological differences
- Establish that the application variety is different from the most similar comparison varieties
 - Often done when a gene has been inserted in the new variety and its presence or absence makes the variety distinct from other varieties

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Biomolecular Data Usage Summary

Number of Certificates Issued with BMT Data cited by the Examiner as a Primary Distinguishing Trait



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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		ADDRESS OR ADDRESS, COUNTRY		VARIETY NAME
ADDRESS (Street and No., or R.F. No., City, State, Zip Code, and Country)				FOR OFFICIAL USE ONLY
				PVP 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-Red Tablestock, 2 = Round-White Tablestock, 3 = Chip-processing, 4 = Frozen-processing
5 = Round Tablestock, 6 = Other

V R1 R2 R3 R4

2. LIGHT SPROUT CHARACTERISTICS: (See Figure 1)

*LIGHT SPROUT: GENERAL SHAPE
1 = Spherical, 2 = Oval, 3 = Ovoid, 4 = Broad cylindrical, 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-rose, 3 = Blue-rose, 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: SHAPE
1 = Closed, 2 = Intermediate, 3 = Open

V R1 R2 R3 R4

USDA/ARS Form 1574-1 (10/06) designed by the Plant Variety Protection Office using Microsoft Word 2003. Page 3 of 14

IMPORTANT: COMPLETE this form in ink and date on all top redlines. Form Approved 2008-06-05

WARNING: The information reported on this form is for regulatory purposes only. It is not to be used for any other purpose. The information reported on this form is for regulatory purposes only. It is not to be used for any other purpose. The information reported on this form is for regulatory purposes only. It is not to be used for any other purpose.

The U.S. Department of Agriculture (USDA) provides this checklist of all the program and products on the basis of the code, variety, age, class, and other attributes on, including, but not limited to, production, yield, color, maturity, growth, and other attributes. The information reported on this form is for regulatory purposes only. It is not to be used for any other purpose.

For a complete list of varieties, visit the USDA website, Office of Plant Variety Protection, 1470 Independence Avenue, S.W., Washington, D.C. 20250-4816 or call (800) 999-3229 or (202) 720-6852, (202) 720-6858.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20715

E-888B-C

OBJECTIVE DESCRIPTION OF VARIETY Lettuce (Lactuca sativa L.)

NAME OF APPLICANT (S)	VARIETY OR TEMPORARY DESIGNATION	VARIETY NAME
ADDRESS (Street & No., or P.O. Box, City, State, Zip Code, and Country)	FOR OFFICIAL USE ONLY	
		PIVOT NUMBER

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

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 nearest standard variety (USDA).

Application Variety (s) 1: _____ Heat Sinker Variety (s): _____

Standard Regional Check Variety (s): _____

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

01 = Cutleaf Leaf	04 = Core or Roman	07 = Bibb Group	10 = Leaf
02 = Butterhead	05 = Core-Lettuce Group	08 = Boston/Boston Group	11 = Core (Spun)
03 = Bibb	06 = Varying Group	09 = Core	

(a) (b) (c)

2. SEED:

01 = <input type="checkbox"/> COLOR	04 = <input type="checkbox"/> LIGHT DEMANDANCE	07 = <input type="checkbox"/> HEAT DEMANDANCE
02 = <input type="checkbox"/> 1 = White (Silver-Grey)	05 = <input type="checkbox"/> 1 = Light Required	08 = <input type="checkbox"/> 1 = Susceptible
03 = <input type="checkbox"/> 2 = Black (Very Brown)	06 = <input type="checkbox"/> 2 = Light Not Required	09 = <input type="checkbox"/> 2 = Not Susceptible
04 = <input type="checkbox"/> 3 = Brown (Dark)		

(a) (b) (c)

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 COTYLEDON: 1 = Broad 2 = Intermediate 3 = Oblong

(a) (b) (c)

SHAPE OF FOURTH LEAF: 1 = 2 = 3 =

(a) (b) (c)

E-888-B (Rev. 05/07) designed by the Plant Variety Protection Office using Microsoft Word 2003. Page 1 of 8

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FORM 52-472-08
(9-1-82)

United States Department of Agriculture, Agricultural Marketing Service
Science Division, Plant Variety Protection Office
National Applications Library Building, Room 502
Beltsville, MD 20715

(Cont. N-122)

OBJECTIVE DESCRIPTION OF VARIETY Lettuce (Lactuca sativa L.)

NAME OF APPLICANT(S)	Variety Seed Source	Variety Name or Temporary Designation
ADDRESS (Street & No., or P.O. Box, City, State, Zip Code and Country)	FOR OFFICIAL USE ONLY	
		PIVOT NUMBER

Place the appropriate number that describes the varietal character(s) typical of this variety in the spaces below. Right justify each number by adding leading zeros, if necessary. Symbols should be given (see to right) to an adequate variety description. Traits designated by a "*" are considered necessary for an adequate variety description and must be completed.

COLOR CODES: (Use in conjunction with Munsell color code to describe all color choices; describe R5 and R6 in Comments section):

01 = Light Green	06 = Yellow-Green	11 = Yellow	16 = Purple	21 = Tan
02 = Medium Green	07 = Yellow-Orange	12 = Orange	17 = Purple-Black	22 = Tan-Black
03 = Dark Green	08 = Orange	13 = Red	18 = Black	23 = Black
04 = Dark Yellow-Green	09 = Orange-Red	14 = Red-White	19 = Black-White	24 = Black-White (Describe)
05 = Yellow	10 = Red-Orange	15 = Red-Black	20 = Black-Black	

STANDARD HEAT UNITS: (Use the most similar (in background and activity) of these to make comparisons based on growing trial data; follow the format below):

Family: _____	Heat Unit (abbreviated): _____	Seed Size: _____
Accession: _____	Heat Unit (abbreviated): _____	Seed Size: _____
Accession: _____	Heat Unit (abbreviated): _____	Seed Size: _____
Accession: _____	Heat Unit (abbreviated): _____	Seed Size: _____
Accession: _____	Heat Unit (abbreviated): _____	Seed Size: _____
Accession: _____	Heat Unit (abbreviated): _____	Seed Size: _____

1. TYPE: (See list of suggested check varieties in Comments section)

* 1 = Core 2 = Core-Lettuce 3 = Bibb 4 = Boston 5 = Core (Spun) 6 = Other

2. REGEN WHERE DEVELOPED IN THE U.S.A.:

* 1 = Northeast 2 = Northcentral 3 = Midwest 4 = Southeast 5 = Southcentral 6 = Other

3. MATURITY: (In Region Based Availability; show heat unit family in Comments section):

HEAT UNITS: _____

* _____ From emergence to 50% of plants in pollen

* _____ From 10% to 90% pollen shed

(1) _____ From 50% pollen to optimum edible quality

* _____ From 50% pollen to harvest at 25% moisture

4. PLANT:

Standard Deviation	Sample Size	Standard Deviation	Sample Size
* <input type="checkbox"/> _____ on Plant Height (to basal tip)	_____	_____	_____
* <input type="checkbox"/> _____ on Ear Height (to base of top ear node)	_____	_____	_____
* <input type="checkbox"/> _____ on Length of Top Ear Interspace	_____	_____	_____
* <input type="checkbox"/> _____ Average Number of Fillers	_____	_____	_____
* <input type="checkbox"/> _____ Average Number of Ears per Plant	_____	_____	_____
* <input type="checkbox"/> _____ Attachment of Root Roots: 1 = Absent 2 = Faint 3 = Moderate 4 = Dark	_____	_____	_____

Application Variety Data Page 1 Standard Inbred Data

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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

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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

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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

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Summation

- Distinctness
- Uniformity
- Stability