

OBJECTIVE DESCRIPTION OF VARIETY
CHINESE CABBAGE (*Brassica chinensis* or *B. Pekinensis*)

INSTRUCTIONS

This form is meant to be used with *Brassica rapa rosularis* or *Brassica rapa var chinensis*, which is known as pak choy, bok choy, celery mustard, Chinese chard, Chinese mustard, Chinese cabbage. This Asian vegetable is also called...

China: bok choy, pak choy, tai koo choy, bai cai, hei cai, paak tsai, piao er cia, ta ge cai, tai gu cai, wu ta cai, qing cai, tsing pak choy
Indonesia: pecai, pecal, petsai, petsay, samho, sesawi putih
Japan: shakushina, tasai, tatsoi
Korea: bok choy
Laos: hach us
Malaysia: sawi, sawi putih
Philippines: pechay, petsay
Sri Lanka: kala gowa
Thailand: ang chaithao, phakkaat farang, phakkaet bai
Vietnam: cai be trang, cai thia, cai thuong hai, cai trang laon

Please read instructions carefully before completing the attached form. The Objective Description Form is a necessary part of an application for Plant Variety Protection (Breeder's Rights) in the United States of America. It is designed to guide the applicant in describing a variety in detail so that comparisons with other varieties in the same crop may be done in a meaningful way. To aid in this goal, data collectors and breeders from different locations should collect the data in a similar fashion. These instructions describe the way in which to take each measurement needed to complete this form. It is possible that some traits are unobtainable for a certain variety, causing some blanks to be left empty. It is in your best interest to describe your variety as completely as possible to establish an adequate variety description.

The applicant's name and complete address should be at the top of the form. The country should be included since it is needed when mailing to some areas. The name of the variety is also entered at the top of the form. The Plant Variety Protection Office will assign a unique PVPO Number to each application and enter it below the variety name.

The variety that you choose for comparison should be the most similar one in terms of background and maturity. The comparison variety (ies) used should be grown in field trials with the application variety for 2-3 location/years (environments) **in the region and season of best adaptability**. The varietal and environmental data collection should remain available for an additional 3 years to resolve any questions concerning comparisons or descriptions of varieties. In general, measurements of quantitative traits should be **taken from one trial on 15-25 randomly selected plants or plant parts** to obtain averages and statistics that describe a typical field of variety.

1. OVERALL PLANT HABIT

- Name the variety to be used for comparison. Describe the comparison variety in the right-hand column for all traits on form.
- Name the location where data was collected to complete this form.
- Identify the plant species. If it is a species not listed on the form, then name it in the space provided.
- Indicate the season in which the variety flowers.
- Measure the average number of days from planting seeds to harvesting.
- Measure the average number of days from transplanting to harvesting.
- Indicate the length of the harvesting season.
- Measure the average plant height from ground level to top of plant at maturity.
- Measure the average plant width at maturity.
- Indicate whether anthocyanin is present on the seedling.
- If anthocyanin is present, indicate where on the seedling it is located.

2. FOLIAGE

- Measure the average leaf width (at its widest) and length. Include the petiole.
- Measure the average number of leaves per mature plant.
- Describe the color, outline, and cross section of mature leaves.
- Describe the leaf veins, leaf surface, leaf habit, and leaf attachment.

3. PETIOLE

- Measure the length and diameter of mature leaf petioles.
- Describe the petiole color.
- Describe the petiole margins.

4. FLOWER

- Measure the average flower diameter, from petal edge, across the middle, to petal edge.
- Measure the average flower stalk height.
- Describe the color of the flower. If subtle coloring differences are to be used, describe the flower color by naming the color and listing the color chart code. For example, in the Royal Horticultural Society chart: RHS 78A (Imperial Purple); or in the Munsell Book of Color: Munsell 2.5RP 4/12 (reddish purple).
- Report the amount of seed set.
- Report the seed coat color.

5. DISEASE REACTION

-- Test as many disease reactions as possible BEFORE applying for protection. Tests for disease reactions should include a resistant check and a susceptible check for each disease being tested. When using disease resistance to describe distinctness, information on these checks should be included in the distinctness statement in support of the distinctness claim. Rate the application variety and the comparison variety on a scale of 1 (most susceptible) to 9 (most resistant) for each disease reaction being reported. Give the scientific and common names of each disease for completeness and the race or strain, if known.

6. ENVIRONMENTAL REACTION

- Report the variety's response to heat, drought, wind (whiptail), and bolting.

REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved OMB NO 0581-0055

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotope, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

**U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE**

**OBJECTIVE DESCRIPTION OF VARIETY
PAK CHOI or CHINESE CABBAGE
(*Brassica chinensis* or *B. pekinensis*)**

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
ADDRESS (Street and No. or RD No., City, State, Zip Code and Country)		<div style="background-color: #cccccc; padding: 2px;">FOR OFFICIAL USE ONLY</div> PVPO NUMBER

PLEASE READ ALL INSTRUCTIONS CAREFULLY:

In the spaces on the left, enter the appropriate numbers that describe the characteristics of the application variety. On the right, enter the appropriate numbers that describe the characteristics of the most similar comparison variety. Right justify whole numbers by adding leading zeros if necessary. The variety that you choose for comparison should be the most similar one in terms of overall morphology, background and maturity. The comparison variety should be grown in field trials with the application variety for 2-3 location/years (environments) in the region and season of best adaptability. In general, measurements of quantitative traits should be taken from one trial on 15-25 randomly selected plants or plant parts to obtain averages and statistics that describe a typical field of the variety.

1. OVERALL PLANT HABIT:

Data Collection Site _____

___ Species: 1 = *B. chinensis* 2 = *B. pekinensis* 3 = Other _____

___ U. S. Region of Best Adaptation: 1 = North West 2 = North Central 3 = North East
4 = South East 5 = South West 6 = Most Regions

___ Harvest Season: 1 = Late Fall – Early Winter 2 = Late Winter – Early Spring
3 = Late Spring – Early Summer 4 = Late Summer – Early Fall
5 = Autumn 6 = Winter

___ Days from Direct Seeding to Harvest

___ Days from Transplanting to Harvest

___ Length of Harvest Season in Days

___ . ___ cm Plant Height at Maturity

___ . ___ cm Plant Width at Maturity

___ Seedling Anthocyanin: 1 = Absent 2 = Present

___ Anthocyanin Location: 1 = Leaves Only 2 = Stem Only 3 = Both Leaves and Stem

Comparison Variety Name _____

___ Species

___ Region of Adaptation

___ Harvest Season

___ days from Seeding to Harvest

___ days from Transplanting to Harvest

___ days in Harvest Season

___ . ___ cm Plant Height

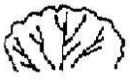
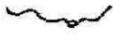
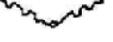
___ . ___ cm Plant Width

___ Seedling Anthocyanin

___ Anthocyanin Location

Application Variety Data

Comparison Variety Data

Application Variety Data	Comparison Variety Data
<p>2. FOLIAGE:</p> <p>_____ . ____ cm Leaf Length</p> <p>_____ . ____ cm Leaf Width</p> <p>_____ Number of Leaves per Mature Plant</p> <p>__ Leaf Color: 1 = Light Green 2 = Medium Green 3 = Dark Green 4 = Blue Green 5 = Gray Green 6 = Yellow Green 7 = Other _____</p> <p>Color Chart Name _____ Color Chart Value _____</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  1 = Entire </div> <div style="text-align: center;">  2 = Sinuated </div> <div style="text-align: center;">  3 = Other </div> </div> <p>__ Leaf Outline:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  1 = Straight </div> <div style="text-align: center;">  2 = Wavy </div> <div style="text-align: center;">  3 = Folded </div> </div> <p>__ Leaf Cross Section:</p> <p>__ Leaf Vein Thickness: 1 = Thin 2 = Thick</p> <p>__ Leaf Surface: 1 = Smooth 2 = Wrinkled 3 = Blistered 4 = Ribbed</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  1 = Cupped </div> <div style="text-align: center;">  2 = Erect </div> <div style="text-align: center;">  3 = Projecting </div> <div style="text-align: center;">  4 = Drooping </div> </div> <p>__ Leaf Habit:</p> <p>__ Leaf Attachment: 1 = Mostly Sessile 2 = Mostly Petiolate 3 = Equally Sessile and Petiolate</p>	<p>_____ . ____ cm Leaf Length</p> <p>_____ . ____ cm Leaf Width</p> <p>_____ No. of Leaves/Mature Plant</p> <p>__ Leaf Color</p> <p>Color Chart Value _____</p> <p>__ Leaf Outline</p> <p>__ Leaf Cross Section</p> <p>__ Leaf Vein Thickness</p> <p>__ Leaf Surface</p> <p>__ Leaf Habit</p> <p>__ Leaf Attachment</p>
<p>3. PETIOLE:</p> <p>_____ . ____ cm Petiole Length</p> <p>_____ . ____ mm Petiole Diameter</p> <p>__ Petiole Color: 1 = White 2 = Green-White 3 = Yellow-White</p> <p>__ Petiole Margin: 1 = Smooth 2 = Wavy</p>	<p>_____ . ____ cm Petiole Length</p> <p>_____ . ____ mm Petiole Diameter</p> <p>__ Petiole Color</p> <p>__ Petiole Margin</p>
<p>4. FLOWER:</p> <p>_____ . ____ mm Flower Diameter</p> <p>_____ . ____ cm Flower Stalk Height</p> <p>__ Flower Color: 1 = White 2 = Yellow 3 = Other _____</p> <p>Color Chart Name _____ Color Chart Value _____</p> <p>__ Seed Set: 1 = None 2 = Poor 3 = Fair 4 = Good 5 = Excellent</p> <p>__ Seed Coat Color: 1 = White 2 = Tan 3 = Brown 4 = Black 5 = Other _____</p>	<p>_____ . ____ mm Flower Diameter</p> <p>_____ . ____ cm Flower Stalk Height</p> <p>__ Flower Color</p> <p>Color Chart Value _____</p> <p>__ Seed Set</p> <p>__ Seed Coat Color</p>
Application Variety Data	Comparison Variety Data

Application Variety Data	Comparison Variety Data
5. RESISTANCE: (Rating Scale 1 = Susceptible, 5 = Intermediate, 9 = Resistant)	
<input type="checkbox"/> Bacterial Spot	<input type="checkbox"/> Bacterial Spot
<input type="checkbox"/> Phytophthora Root Rot	<input type="checkbox"/> Phytophthora Root Rot
<input type="checkbox"/> Black Rot	<input type="checkbox"/> Black Rot
<input type="checkbox"/> Cercospora Leaf Spot	<input type="checkbox"/> Cercospora Leaf Spot
<input type="checkbox"/> Powdery Mildew	<input type="checkbox"/> Powdery Mildew
<input type="checkbox"/> Black Leg	<input type="checkbox"/> Black Leg
<input type="checkbox"/> Ring Spot	<input type="checkbox"/> Ring Spot
<input type="checkbox"/> Yellows	<input type="checkbox"/> Yellows
<input type="checkbox"/> Clubroot	<input type="checkbox"/> Clubroot
<input type="checkbox"/> White Blister	<input type="checkbox"/> White Blister
<input type="checkbox"/> Bottom Rot	<input type="checkbox"/> Bottom Rot
<input type="checkbox"/> Downy Mildew	<input type="checkbox"/> Downy Mildew
<input type="checkbox"/> Verticillium Wilt	<input type="checkbox"/> Verticillium Wilt
<input type="checkbox"/> Cauliflower Mosaic	<input type="checkbox"/> Cauliflower Mosaic
<input type="checkbox"/> Turnip Yellow Mosaic	<input type="checkbox"/> Turnip Yellow Mosaic
<input type="checkbox"/> Wire Stem	<input type="checkbox"/> Wire Stem
<input type="checkbox"/> Other Diseases (Specify) _____	<input type="checkbox"/> Other Diseases (Specify) _____
6. ENVIRONMENTAL REACTIONS: (Rating Scale 1 = Susceptible, 5 = Intermediate, 9 = Resistant)	
<input type="checkbox"/> Whiptail	<input type="checkbox"/>
<input type="checkbox"/> Heat Resistance	<input type="checkbox"/>
<input type="checkbox"/> Drought	<input type="checkbox"/>
<input type="checkbox"/> Bolting	<input type="checkbox"/>
7. COMMENTS: Attach ONE photographic print of the application variety and the comparison variety described above, indicating the identity of each variety. This photograph should show leaves of each variety at a magnification sufficient to identify most of the verbal descriptors given above. (Additional information and photographs in support of this application may be supplied as part of the Exhibits B or D.)	