No. 9900331

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SUNFLOWER

'PHA305'

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 twelfth day of September, in the year two thousand one.

Attest:

Paul M. Jankowski

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a).

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Pioneer Hi-Bred International, Inc.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

3. VARIETY NAME
PHA305

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
700 Capital Square
400 Locust Street
Des Moines, Iowa 50309

5. TELEPHONE *(include area code)*
(515) 270-5988

6. FAX *(include area code)*
(515) 253-2288

FOR OFFICIAL USE ONLY

PVPO NUMBER: 9900331

FILING DATE: June 15-1999

7. GENUS AND SPECIES NAME
Helianthus annuus

8. FAMILY NAME *(Botanical)*
Compositae (Asteraceae)

9. CROP KIND NAME *(Common name)*
Sunflower

FEES RECEIVED
FILING AND EXAMINATION FEE: $ 2450.00
DATE: 6-9-99
CERTIFICATION FEE: $ 320-
DATE: July 23, 2001

10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.) (Common name)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Iowa

12. DATE OF INCORPORATION
May 6, 1926

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Dr. John F. Soper
7300 N.W. 62nd Avenue
PO Box 1004
Johnston, Iowa 50131

14. TELEPHONE *(include area code)*
(515) 270-5988

15. FAX *(include area code)*
(515) 253-2288

16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow instructions on reverse)*

- a. ☑ Exhibit A. Origin and Breeding History of the Variety
- b. ☑ Exhibit B. Statement of Distinctness
- c. ☑ Exhibit C. Objective Description of the Variety
- d. ☑ Exhibit D. Additional Description of the Variety
- e. ☑ Exhibit E. Statement of the Basis of the Applicant's Ownership
- f. ☑ Voucher Sample *(2,600 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository)*
- g. ☑ Filing and Examination Fee ($2450), made payable to "Treasurer of the United State *(Mail to PVPO)*

17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED *(See Section 83(a) of the Plant Variety Protection Act)?*

☐ YES *(If "yes," answer items 18 and 19 below)* ☑ NO *If "no," go to item (20)*

18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

☐ YES ☐ NO

19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

☑ YES *(If "yes," give names of countries and dates)* ☐ NO

U.S., January 1999

21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate

The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*		SIGNATURE OF APPLICANT *(Owner(s))*	
NAME *(Please print or type)* John F. Soper		NAME *(Please print or type)*	
CAPACITY OR TITLE: Director, Sunflower Research	DATE: May 3, 1999	CAPACITY OR TITLE	DATE

SD-470 (04-95) *(Previous editions are to be destroyed)* *(See reverse for instructions and information collection burden statement)*

Exhibit A. Origin and Breeding History of the Variety

Sunflower Variety Name: PHA305

PHA305 is an oleic oil type restorer line, developed by Pioneer Hi-Bred International that derives from a selfed selection made out of the Pioneer hybrid PHA144/PHA157. The pedigree method was used in the development of this line. It is a bulk of F7 seed tracing back to a single F6 selection. It is homozygous for recessive branching and dominant fertility restoration of the CMS PET 1 cytoplasm.

PHA305 was tested and selected for commercial use based on its superior combining ability for yield potential with CMS "a-lines" and particularly for its contribution of increased oleic acid content in hybrid combinations. Hybrids using PHA305 as a restorer parent are well adapted to the Northern Plains of the United States, and Central/Western Europe.

PHA305 has been found by the breeder to be uniform and stable for all plant traits, as described in Exhibit C, with evidence of variants. no. (BT: 5/16/2001. With applicant's permission)

Exhibit B: Statement of Distinctness

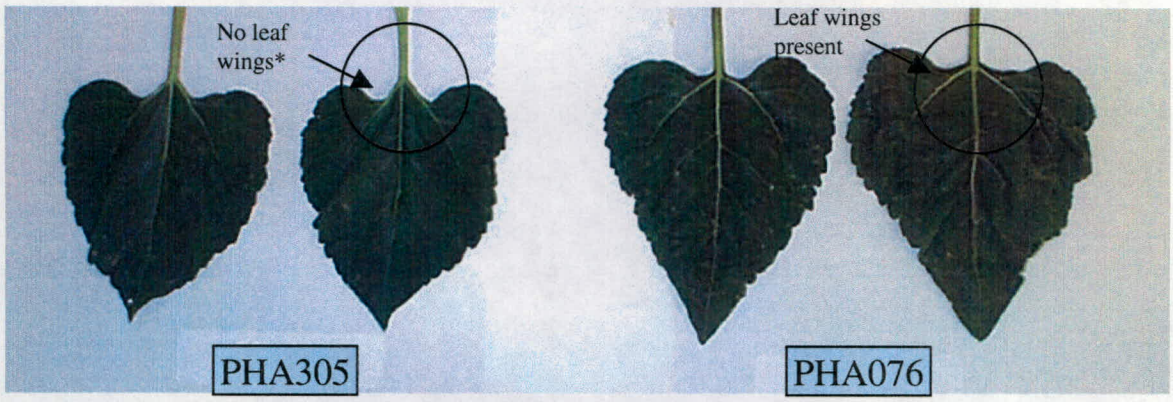
Sunflower Variety Name: PHA305

PHA305 is a top-branching type high oleic oilseed restorer line. It is most similar to Pioneer Hi-Bred restorer line PHA157, but is also somewhat similar to Pioneer restorer line PHA076. Like PHA305, PHA076 and PHA157 are branched restorer lines possessing a high percentage of oleic acid. However, PHA305 differs from PHA076 and PHA157 for a number of qualitative traits as indicated in the chart below:

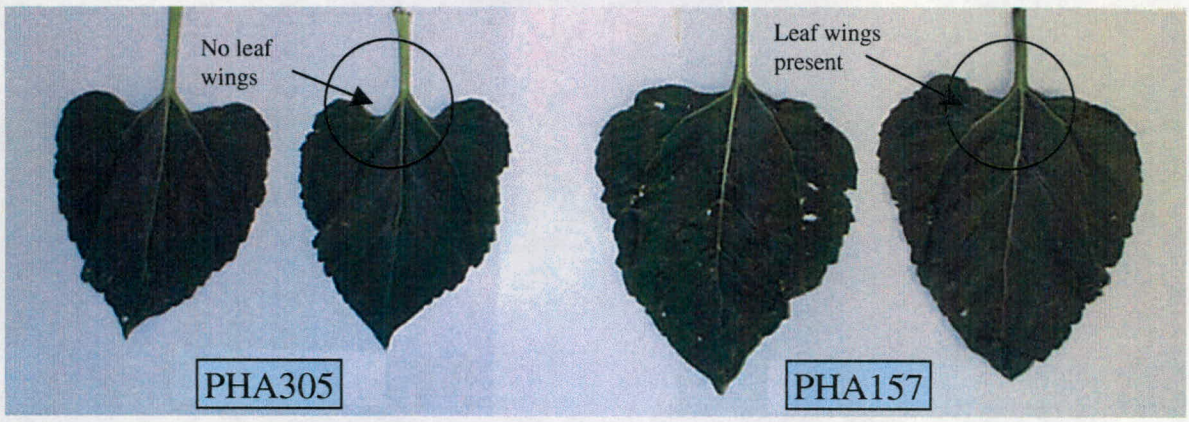
	PHA305	PHA076	PHA157
Hypocotyl anthocyanin	weak	medium	weak
Leaf size	small	medium	medium
Leaf wings	**absent**	**present**	**present**
Stigma anthocyanin	weak	absent	absent
Stem hair below head	weak	medium	weak
Head shape	flat	convex	flat
Stem curvature	fully erect	pendulous	semi-pendulous
Seed size	medium	small	small
Seed thickness	medium	thin	thin

Photographic evidence of leaf morphology differences is attached. The evidence clearly demonstrates the difference in leaf size, differences between the varieties for the absence/presence of leaf wings, and minor shape differences.

Figure 1. PVP Application - 'PHA305': Leaf comparison between PHA305, PHA157, and PHA076



Comparison of PHA305 v. PHA076. Note PHA305's smaller leaf size, slightly rounder shape, and absence of leaf wings..



Comparison of PHA305 v. PHA157. Note PHA305's smaller leaf size, slightly different shape (PHA305 has more prominent lobes) and the absence of leaf wings on PHA305.

FORM APPROVED OMB NO. 40-R 3822

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
COMMODITIES SCIENTIFIC SUPPORT DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(SUNFLOWER)

OBJECTIVE DESCRIPTION OF VARIETY
SUNFLOWER *(HELIANTHUS ANNUUS)*

NAME OF APPLICANT(S)	VARIETY NAME OR TEMPORARY DESIGNATION
Pioneer Hi-Bred International, In	PHA305
ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code)*	FOR OFFICIAL USE ONLY
7300 N.W. 62nd Ave., P.O. 1004 Johnston, IA 50131-1004	PVPO NUMBER 9900331

Place numbers in the boxes (e.g. [0][8][9]) for the characters that best describe typical plants of this variety.

COMPARISON VARIETIES

NON-OIL: 1 = ARROWHEAD 2 = MINGREN 3 = SUNDAK 4 = PEREDOVIK
OIL: 5 = KRASNODARETS 6 = OTHER RHA346 7 = OTHER _____ 8 = OTHER _____

1. CLASS:

[1] 1 = OIL TYPE 2 = NON-OIL TYPE *(confectionery)*

2. MATURITY:

[59] NO. OF DAYS TO HEAD FIRST VISIBLE *(from emergence)*

[7] DAYS EARLIER THAN [6]
HEADING SAME AS [ ] COMPARISON VARIETY
[ ] DAYS LATER THAN [ ]

[90] NO. OF DAYS TO HARVEST RIPENESS *(from emergence)*

[10] DAYS EARLIER THAN [6]
MATURITY SAME AS [ ] COMPARISON VARIETY
[ ] DAYS LATER THAN [ ]

3. HEIGHT:

[97] cm TALL AT HARVEST RIPENESS

[32] cm SHORTER THAN [6]
SAME AS [ ]
[ ] cm TALLER THAN [ ]

4. STEM:

[4.9] (1 decimal place) LENGTH OF INTERNODE AT HARVEST RIPENESS

[0.1] (2 decimal places) cm SHORTER THAN [6]
SAME AS [ ] COMPARISON VARIETY
[ ] (2 decimal places) cm LONGER THAN [ ]

[20] NUMBER OF LEAVES

[9] FEWER LEAVES THAN [6]
SAME AS [ ] COMPARISON VARIETY
[ ] MORE LEAVES THAN [ ]

[3] BRANCHING: 1 = NO BRANCHING 2 = BASAL BRANCHING
3 = TOP BRANCHING *(with central head)* 4 = FULLY BRANCHED *(without central head)*
5 = OTHER _____

[1] COLOR OF GROWING POINT: 1 = GREEN 2 = YELLOW

5. LEAVES (Midstem at flowering):

22.0 (1 decimal place) CM. BLADE LENGTH

1.0 (1 decimal place) CM. SHORTER THAN [6]

LENGTH SAME AS [ ] } COMPARISON VARIETY

[ ] (1 decimal place) CM. LONGER THAN [ ]

21.0 (1 decimal place) CM. BLADE WIDTH

[ ] (1 decimal place) CM. NARROWER THAN [ ]

WIDTH SAME AS [6] } COMPARISON VARIETY

[ ] (1 decimal place) CM. WIDER THAN [ ]

[1] WIDTH: LENGTH RATIO: 1 = NARROWER THAN LONG 2 = EQUAL 3 = WIDER THAN LONG

1 [~~2~~] LEAF SHAPE: 1 = CORDATE 2 = OTHER ~~TRIANGULAR~~ CORDATE (5/15/2001:BT WITH APPLICANT'S PERMISSION) 9900331

[1] LEAF APEX: 1 = ACUMINATE 2 = OTHER _____

[2] LEAF BASE: 1 = AURICULATE 2 = TRUNCATE

(BT:5/15/2001) 4 [~~3~~] LEAF MARGIN: 1 = ENTIRE 2 = FINELY CRENATE 3 = COARSELY CRENATE 4 = OTHER MEDIUM SERRATE

[2] DEPTH OF MARGIN INDENTATION: 1 = SHALLOW 2 = INTERMEDIATE 3 = DEEP

[3] ATTITUDE: 1 = ERECT 2 = ASCENDING 3 = HORIZONTAL 4 = DESCENDING

[2] SURFACE: 1 = SMOOTH 2 = CRINKLED (ridged) 3 = OTHER _____

[2] COLOR: 1 = LIGHT GREEN 2 = GREEN 3 = DARK GREEN 4 = BROWN

[1] MARGIN COLOR: 1 = GREEN 2 = YELLOW

6. HEAD AT FLOWERING:

[2] RAY FLOWERS: 1 = ABSENT 2 = PRESENT

[1] RAY FLOWER COLOR: 1 = YELLOW 2 = SULFUR YELLOW 3 = ORANGE YELLOW 4 = OTHER _____

[1] DISK FLOWER COLOR: 1 = YELLOW 2 = RED 3 = PURPLE

[2] ANTHOCYANIN IN STIGMAS: 1 = ABSENT 2 = PRESENT

[2] POLLEN COLOR: 1 = WHITE (colorless) 2 = YELLOW

[1] PAPPI: 1 = GREEN 2 = RUST (red)

66.0 (1 decimal place) MM. RAY LENGTH

[ ] (1 decimal place) MM. SHORTER THAN [ ]

SAME AS [ ] } COMPARISON VARIETY

2.0 (1 decimal place) MM. LONGER THAN [6]

10.0 (1 decimal place) MM. RAY WIDTH

6.0 (1 decimal place) MM. NARROWER THAN [6]

SAME AS [ ]

[ ] (1 decimal place) MM. WIDER THAN [ ]

Variety Name PHA305

7. HEAD AT SEED MATURITY:

10.0 (1 decimal place) CM. DIAMETER

2.0 (1 decimal place) CM. NARROWER THAN [6]

SAME AS [ ]

(1 decimal place) CM. WIDER THAN [ ]

COMPARISON VARIETY

9900331

[1] RECEPTACLE SHAPE: 1 = FLAT 2 = CONVEX 3 = CONCAVE

[1] HEAD ATTITUDE: 1 = VERTICAL *(erect)* 2 = ASCENDING 3 = HORIZONTAL 4 = DESCENDING

600 NO. OF SEEDS PER HEAD

200 SEEDS/HEAD LESS THAN [6]

SEEDS/HEAD SAME AS [ ]

SEEDS/HEAD MORE THAN [ ]

COMPARISON VARIETY

8. SEEDS:

[2] OUTER PERICARP: 1 = CLEAR 2 = STRIPED BLACK 3 = NEARLY SOLID BLACK 4 = OTHER _____

[1] MIDDLE PERICARP: 1 = WHITE 2 = SOLID PURPLE

[1] INNER PERICARP *(seed coat)*: 1 = NO COLOR 2 = BROWNISH BLACK

[4] STRIPES: 1 = ABSENT 2 = EVEN BLACK WHITE STRIPES 3 = BROAD BLACK NARROW WHITE

4 = BLACK WITH NARROW DARK-GREY STRIPING 5 = OTHER _____

[1] MOTTLING: 1 = ABSENT 2 = PRESENT

[4] SHAPE: 1 = OVATE 2 = OBOVATE *(shield)* 3 = NARROWLY OBOVATE 4 = OBLONG 5 = ELLIPTIC

[2] SHAPE *(cross-section)* : 1 = NOT CURVED 2 = CURVED

10.0 (1 decimal place) MM. LENGTH

(1 decimal place) MM. SHORTER THAN [ ]

SAME AS [6]

(1 decimal place) MM. LONGER THAN [ ]

COMPARISON VARIETY

2.4 (1 decimal place) GM./100 SEED

1.4 (1 decimal place) GM. LIGHTER THAN [6]

SAME AS [ ]

(1 decimal place) GM. HEAVIER THAN [ ]

COMPARISON VARIETY

0.0 (1 decimal place) % HELD ON 7.9 MM. (20/64) ROUND-HOLE SCREEN

(1 decimal place) % LESS THAN [ ]

SAME AS [ ]

% MORE THAN (1 decimal place) [ ]

COMPARISON VARIETY

Variety Name PHA305

9. DISEASE AND INSECTS (0 = Not tested, 1 = Susceptible, 2 = Resistant):

[0] **RUST** *(Puccinia helianthi)*
GIVE RACES: _____

[0] **VERTICILLIUM WILT** *(Verticillium dahliae)*

[0] **DOWNY MILDEW** *(Plasmorpara halstedii)*
GIVE RACES: _____

[0] **WHITE BLISTER RUST** *(Albugo tragopogi)*

[0] **BROOM RAPE** *(Orobanche cannis)*
GIVE RACES: _____

[0] **EUROPEAN SUNFLOWER MOTH** *(H. nebullela)*

[2] **OTHER** *(specify)* Moderate resistance to root sclerotinia

[0] **SCLEROTINIA WILT** *(Sclerotinia sclerotiorum)*

9900331

[0] **LEAF MOTTLE** *(V. albo-atrum)*

[0] **GRAY-MOLD BLIGHT, BUD ROT** *(Botrytis cinerea)*

[0] **CHARCOAL ROT, STEM ROT** *(Macrophomina phaseolina)*

[0] **SUNFLOWER MOTH, N. AMERICAN HEAD MOTH** *(Homoeosoma electellum)*

[ ] **OTHER** *(specify)* _____

[ ] **OTHER** *(specify)* _____

10. GIVE VARIETY OR VARIETIES THAT MOST CLOSELY RESEMBLE THE SUBMITTED VARIETY. For the following characteristics indicate degree of resemblance by placing in the column marked, D.R., one of the following numbers:
1 = Submitted variety is less, lighter or inferior than comparison variety 2 = Same as 3 = More than, darker, or superior

CHARACTER	VARIETY	D.R.	CHARACTER	VARIETY	D.R.
Frost resistance	RHA346	2	Leaf attitude	RHA346	2
Lodging resistance	RHA346	3	Head attitude	CM586	2
Neck or stem strength	RHA346	2	Ray flower color	RHA346	2
Branching type	RHA801	2	Seed shape	RHA274	2
Petiole length	RHA346	1	Seed color	RHA346	2
Leaf shape	RHA271	2	Seed striping pattern	RHA346	2
Leaf color	RHA346	2	Seed yield	RHA346	1

11. GIVE THE FOLLOWING DATA FOR SUBMITTED AND A SIMILAR VARIETY*.

VARIETY	HULL (%)	PROTEIN (%)	OIL (%)	IODINE NO.	FATTY ACIDS	
					OLEIC (%)	LINOLEIC (%)
Submitted					91.7	2.0
Similar					85.1	6.1
Name of similar variety					RHA346	RHA346

* Hull, protein and oil percentages expressed for whole undecorticated seed; acids expressed as percentages of oil

12. COMMENTS:

All data collected from plots in Woodland, CA in 1996.

Exhibit D. Additional Description of the Variety

9900331

Sunflower Variety Name PHA305

Hybrids utilizing PHA305 are adapted to the growing regions of France, Argentina and the northern Plains of the United States and Canada.

APPENDIX A: PIONEER SUNFLOWER TRAIT DEFINITIONS

9900331

In the description and examples that accompany this application, a number of terms are used herein. In order to provide a clear and consistent understanding of the specification and claims, including the scope to be given such terms, the following definitions are provided for the descriptors used in the data tables included herein.

- 50PFLW - The number of days it takes for 50 percent of the plants to reach the stage of R5.1. R5.1 is when the ray flowers are visible and the first ring of disk flowers has emerged and flowered.
- APDSC – A 1-9 visual rating indicating resistance to aphids. Higher scores indicate higher levels of resistance.
- BNKSC - A 1 to 9 visual rating indicating the level of neck breakage. The higher the score the less breakage that occurs.
- BRTSC – A 1-9 visual rating indicating the amount of brittle snap (early season stalk breakage) due to high winds. The higher the score the less breakage that occurs.
- BSKSC - A 1 to 9 visual rating indicating the level of stalk breakage. The higher the score the less breakage that occurs.
- CLD TST = COLD TEST. The percent of plants that germinate under cold test conditions.
- CTRSSC = A 1 to 9 visual rating indicating the degree of seed set obtained within the sunflower head. A 1 equals a head where only the outer 10% of the head sets seed. A 9 equals a head where 90-100% of the head sets seed.
- CYTOPLASMIC MALE STERILE (CMS) PLANT OR INBRED LINE. A sunflower line that produces no viable pollen is called male sterile. Male sterility is inherited maternally, i.e. the male sterile plant is used as the female parent in a cross with pollen from another sunflower. CMS lines are produced by crossing a maintainer line with a sunflower plant with the cytoplasmic male sterility trait and then backcrossing to the maintainer line until a male sterile line that is homologous to the maintainer line in all other respects is developed. CMS lines are also referred to as female lines.
- DRYRTE= DRYDOWN RATE. This represents the relative rate at which a hybrid will reach acceptable harvest moisture compared to other hybrids. The rate is measured as days required for a hybrid to dry from 40% grain moisture (DYS40M) to 18% grain moisture (DYS18M). A low number of days indicates a hybrid that dries relatively fast while a high number of days indicates a hybrid that dries slowly.

- DNYMSC = A 1 to 9 visual rating indicating the resistance to Downy Mildew (*Plasmopara halstedii*). A higher score indicates greater resistance.
- DYS18M = The number of days (from planting) required for grain to develop and then dry to 18% moisture.
- DYS40M = The number of days (from planting) required for grain to develop and then dry to 40% moisture.
- DYSR9 = The number of days it takes for 50 percent of the plants to reach the R9 developmental stage. This is a stage of physiological maturity that is determined when the back of the flowering head has reached a yellowing stage and the outer bracts of the head have started to brown. This normally is a stage when the seed moisture is at about 30-40% moisture.
- RFSC = Fertility restoration score using a 1-9 scale. This rating is used for hybrids only and is a measure of the ability of a restorer line to restore the male fertility in hybrid combination with a CMS female line. Higher scores represent a higher level of fertility restoration.
- GENASC = General appearance score. A 1-9 rating for overall hybrid appearance. Higher scores indicate better overall appearance.
- HARHT = This is the height of the head at harvest, measured in decimeters.
- HARMST = This is a measure of seed moisture taken at harvest time. It is recorded in percentage of moisture to seed weight.
- HDSSC = Head shape score. Indicates head shape (1 = closed "midge" ball, 2= trumpet, 3 = clam, 4 = concave, 5 = cone, 6 = reflex, 7 = distorted, 8 = convex, 9 = flat).
- HULVSC – Machine hulling score. 1-9 scale. Higher score reflect better hullability (ability of a hulling machine to remove seed hulls from the kernel).
- INC/HA = A calculated trait of the value of oil obtained. Yield (QU/HA) multiplied by the percent oil (OIL10P) multiplied by the average cost paid for sunflower, adjusted for premiums paid based on oil percentage of the grain.
- MDGSC = Resistance to the sunflower midge, *Contarinia schulzi,* based on head deformation. Rated on a 1-9 scale, 9 = no head deformation (fully resistant), 5 = moderate head deformation, 1 = severe head deformation (fully susceptible).
- OIL10P = The percentage of oil content measured from the harvested grain adjusted to a 10% moisture level.
- PCTO13 = Seed size based on the percentage of grain that passes over a "size 13" screen.
- PRMFL = Predicted relative maturity based on flowering date. Range is 0-99, higher values indicate later flowering.
- PRMPHY = Predicted relative maturity based on physiological maturity (DYSR9). Range is 0-99, higher values indicating later physiological maturity.

11

- PHOSC = A 1 to 9 visual rating indicating the resistance to Phomopsis stalk rot (*Phomopsis helianthii*). A higher score indicates a greater resistance.
- PLTHT = This is the height of the head at flowering, measured in decimeters.
- PMASC = A 1 to 9 visual rating indicating the resistance to Phoma stalk rot (*Phoma macdonaldii*. The higher score indicates a greater resistance.
- QU/HA = Yield in quintals per hectare.
- R160 = A measure of the percentage of Palmitic acid found in the oil of the seed as measured by a rapid reading from a gas chromatograph.
- R180 = A measure of the percentage of Stearic acid found in the oil of the seed as measured by a rapid reading from a gas chromatograph.
- R181 = A measure of the percentage of Oleic acid found in the oil of the seed as measured by a rapid reading from a gas chromatograph.
- R182 = A measure of the percentage of Linoleic acid found in the oil of the seed as measured by a rapid reading from a gas chromatograph.
- RESTORER LINE. A line possessing the gene or genes to restore male fertility or viable pollen to a sunflower hybrid or inbred line and progeny having a maternal cytoplasm that conditions male sterility. This term is also discussed in the literature. See for e.g. Fick, "Breeding and Genetics," in Sunflower Science and Technology 279-338 (J.F. Carter ed. 1978), the contents of which are incorporated herein by reference.
- RHZSC = Resistance to Rhizopus head rot. Rating scale from 1-9. Higher scores indicate greater resistance.
- RLGSC = A 1 to 9 visual rating indicating the level of root lodging. The higher the score the less root lodging that occurs.
- RSTSC = A 1 to 9 visual rating indicating the resistance to Rust (*Puccinia helianthii*). A higher score indicates greater resistance.
- SCLHSC = A 1 to 9 visual rating indicating the resistance to Sclerotinia (*Sclerotinia sclerotiorum*), head infection. A higher score indicates a greater resistance.
- SCLRSC = A 1 to 9 visual rating indicating the resistance to Sclerotinia (*Sclerotinia sclerotiorum*), root and basal stalk infection. A higher score indicates a greater resistance.
- SDVSC = Seedling vigor score. 1-9 visual rating taken. Higher scores indicate more seedling vigor (early growth).
- SEPSC = Resistance to Septoria leaf spot. Rating scale from 1-9. Higher scores indicate greater resistance.
- SLFFER = A 1 to 9 visual rating indicating the degree of self fertility found within a self pollinated head. A score of 1 indicates <10% of the seed sets under a bagged self. A score of 9 indicates that 90-100% of the seed sets under a bagged self.

- STKGSC = STAY GREEN. Stay green is the measure of plant health near the time of black layer formation (physiological maturity). A high score indicates better late-season plant health.
- STMCSC = A 1 to 9 visual rating indicating the degree of stem curvature and head attitude. A 1 indicates a very pendulous neck and head whereas a 9 indicates virtually no neck bend and an erect head attitude.
- SUNFLOWER SEED. Botanically referred to as an "achene", comprised of the pericarp and embryo.
- TSTWTM = Test weight of seed measured in kilograms per hectoliter.
- VERWSC = A 1 to 9 visual rating indicating the resistance to Verticillium wilt (*Verticillium dahliae*). A higher score indicates a greater resistance.

Exhibit E. Statement of the Basis of the Applicant's Ownership

Sunflower Variety Name: PHA305

PHA305 was originated and developed by plant breeders employed by Pioneer Hi-Bred International, Inc. from whom, by agreement, Pioneer Hi-Bred International Inc. has obtained exclusive rights and ownership of PHA305. No rights to variety PHA305 are retained by the plant breeder or by any other party.