No. 9900375

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, CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR USING IT IN CING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY CTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN, FIELD

'PH1MR'

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 sixth day of November, in the year two thousand one.

PLANT VARIETY PROTECTION OFFICE · U.S. DEPARTMENT OF AGRICULTURE

Attest:

Paul M. Sandoval

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Greman

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 AND TECHNOLOGY 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) and the Paperwork Reduction Act (PRA) of 1995.

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 OWNER: Pioneer Hi-Bred International, Inc.
2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER:
3. VARIETY NAME: PH1MR
4. ADDRESS (*Street and No. or RFD No., City, State and Zip Code, and Country*): 7301 NW 62nd Avenue, P.O. Box 85, Johnston, IA 50131-0085
5. TELEPHONE (*include area code*): 515/270-4051
6. FAX (*Include area code*): 515/253-2125

FOR OFFICIAL USE ONLY
PVPO NUMBER: 9900375
FILING DATE: 7/30/99

7. IF THE OWNERNAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (*corporation, partnership, association, etc.*): Corporation
8. IF INCORPORATED, GIVE STATE OF INCORPORATION): IOWA
9. DATE OF INCORPORATON: May 6, 1926

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION (FIRST PERSON LISTED WILL RECEIVE ALL PAPERS)

Steven R. Anderson
Research and Product Development
P.O. Box 85
Johnston, IA 50131-0085

FEES RECEIVED
FILING & EXAMINATION FEES: $ 2450.00 DATE 7-30-99
CERTIFICATION FEE: $ 320.00 DATE 10/1/01

11. TELEPHONE (*Include area code*): 515/270-4051
12. FAX (*Include area code*): 515/253-2125
13. E_MAIL: ANDERSONS@PHIBRED.COM
14. CROP KIND NAME (*Common name*): Corn

15. GENUS AND SPECIES NAME OF CROP: *Zea Mays*
16. FAMILY NAME (*Botanical*): Gramineae JRM 3/8/01
17. IS THE VARIETY A FIRST GENERATION HYBRID? ☐ Yes ☒ No

18. 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 (*Optional*)
- e. ☒ Exhibit E. Statement of the Basis of the Owner's Ownership
- f. ☒ Voucher Sample (*2500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in an approved public repository*)
- g. ☒ Filing and Examination Fee ($2,450), made payable to "Treasurer of the United States" (*Mail to Plant Variety Protection Office*))

19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act) ☐ YES (If "yes", answer items 20 and 21 below) ☒ NO (If "no", go to item 22)

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? ☐ YES ☐ NO

21. IF "YES" TO ITEM 20, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U.S. OR OTHER COUNTRIES? ☒ YES ☐ NO

IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (*Please use space indicated on reverse*)

United States and Canada Nov. 1, 1998

23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? ☐ YES ☒ NO

IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (*Please use space indicated on reverse.*)

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

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

SIGNATURE OF OWNER		SIGNATURE OF OWNER: Steven R Anderson	
NAME (*Please print or type*)		NAME (*Please print or type*): Steven R. Anderson	
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE: Senior Research Associate	DATE: 7-29-99

S&T-470 (06-98DESIGNED BY THE Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (03-96) which is obsolete. (*See reverse for instructions and information collection burden statement*)

INSTRUCTIONS

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GENERAL: To be effectively filed with the Plant Variety protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed Exhibits A,B,C,E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety sy Irsdy 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in a approved public repository; (4) check drawn on a U.S. bank for $2,450 ($300 filing fee and $2,150 examination fee), payable to "Treasurer of the United States" *(See Section 97.6 of the Regulations and Rules of Practice.)* Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfiled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. DO NOT use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of $300 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office
Telephone: (301)504-5518
FAX: (301)504-5291
Homepage: http://www.ams.usda.gov/science/pvp.htm

ITEM

18a. Give:
(1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified.

18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens of photographs (prints) of seed and plant comparisons which clearly indicate distinctness.

18c. Exhibit C forms are available from the PVPO for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.

18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant disease resistance, etc.

18e. Section 52(5) of the Act required applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.

19. If "Yes" is specified *(seed of this variety be sold by variety name only, as a class of* certified seed), the applicant may NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, applicant may change the choice. *(See Regulations and Rules of Practice, Section 7.103).*

22. *See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.*

23. See Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date.

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22. CONTINUED FROM FRONT (*Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.*)

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23. CONTINUED FROM FRONT (*Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).*

NOTES; It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. *(See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of Regulations and Rules of Practice.)*

To avoid conflict with other variety names in use, the applicant should check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center--East, Beltsville, MD 20705. Telephone: (301) 504-8089.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate of any other aspect of this collection of information, including suggestions for reducing this burden , to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your letter. Under the PRA of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-2791. To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

Exhibit A. Origin and Breeding History

9900375

Pedigree: PHP02/PHR31)XP12W3142W32X

Pioneer Line PH1MR, Zea mays L., a dent corn inbred, was developed by Pioneer Hi-Bred International, Inc. from the single cross hybrid PHP02 (PVP Certificate No. 8800212) X PHR31 (PVP Certificate No. 9200090) using the pedigree method of plant breeding. Varieties PHP02 and PHR31 are proprietary inbred lines of Pioneer Hi-Bred International, Inc. Selfing and selection were practiced within the segregating population from the above hybrid for 9 generations using pedigree selection. During line development, crosses were made to inbred testers for the purpose of estimating the line's combining ability. Yield trials were grown at Janesville, Wisconsin as well as other Pioneer research locations. After initial testing, additional hybrid combinations have been evaluated and subsequent generations of the line have been grown and hand-pollinated with observations again made for uniformity.

Variety PH1MR has shown uniformity and stability for all traits as described in Exhibit C - "Objective Description of Variety". It has been self-pollinated and ear-rowed 8 generations with careful attention paid to selection criteria and uniformity of plant type to assure genetic homozygosity and phenotypic stability. The line has been increased both by hand and in isolated fields with continued observations for uniformity and stability for a minimum of 4 generations during the final stages of inbred development and seed multiplication. Very high standards for genetic purity have been established morphologically using field observations and electrophoretically using sound lab molecular marker methodology.

No variant traits have been observed or are expected in PH1MR.

The criteria used in the selection of PH1MR were yield, both per se and in hybrid combinations; late season plant health, grain quality, stalk lodging resistance, and kernel size, especially important in production. Other selection criteria include: ability to germinate in adverse conditions; number of tillers, especially important in production because having numerous tillers increases hybrid production costs spent on detasseling; disease and insect resistance; pollen yield and tassel size.

Exhibit A: Developmental history for PH1MR

Season/Year Pedigree Grown	Inbreeding Level of Pedigree Grown
Summer, 1989	F0
Winter, 1989-90	F1
Summer, 1990	F2
Summer, 1991	F3
Winter, 1991-92	F4
Summer, 1992	F5
Summer, 1993	F6
Summer, 1994	F7
Winter, 1994-95	F8
Summer, 1995	F9
Winter, 1995-96	F10
	F11 Bulk increase for transfer to SM

*PH1MR was selfed and ear-rowed from F3 through F10 generation.
#Uniformity and stability were established from F8 through F11 generation and beyond when seed supplies were increased.

Exhibit B. Novelty Statement

Variety PH1MR mostly resembles Pioneer Hi-Bred International, Inc. proprietary inbred line PHR31 (PVP Certificate No. 9200090). The data in Tables 1A and 1B are from paired comparisons collected primarily in Johnston and Ankeny, IA. The data in Table 2 are from paired comparisons at multiple locations grown primarily in the adapted growing area of PH1MR. The traits collectively show measurable differences between the two varieties.

Variety PH1MR has a shorter husk extension length (1.6 cm vs 3.9 cm) than PHR31 (Table 1A, 1B).

Variety PH1MR has a longer tassel peduncle length (20.3 cm vs 16.8 cm) than PHR31 (Table 1A, 1B).

Variety PH1MR has a lower tassel primary branch number (5.8 vs 10.6) than PHR31 (Table 1A, 1B).

Variety PH1MR reaches 50%pollen shed (GDUSHD) sooner (1270 GDU's vs 1379 GDU's) than PHR31 (Table 2).

Variety PH1MR reaches 50%silking (GDUSLK) sooner (1315 GDU's vs 1412 GDU's) than PHR31 (Table 2).

SMS 8/16/01

A t-test was used to compare differences between means and the appropriate parameters have been included. Due to the way our historical data has been stored, it is difficult to obtain standard deviations for table 2.

Exhibit B Novelty Statement Tables

Table 1A. These data indicate differences between varieties PH1MR and PHR31. Data are from Johnston and Ankeny, Iowa in 1998. Environments had different planting dates. A t-test was used to compare differences between means.

station	year	Trait	variety-1	variety-2	Count-1	Count-2	Mean-1	Mean-2	StdDeviation-1	StdDeviation-2	StdError-1	StdError-2	Mean Diff	DF Pooled	t-Value Pooled	Prob (2-tail) Pooled
AD	1998	husk extension length (cm)	PH1MR	PHR31	5	5	1.0	3.4	0.707	0.548	0.316	0.245	-2.4	8	-6.00	0.000
IT	1998	husk extension length (cm)	PH1MR	PHR31	5	5	2.2	4.4	1.643	1.140	0.735	0.510	-2.2	8	-2.46	0.039
AD	1998	tassel peduncle length (cm)	PH1MR	PHR31	4	5	18.3	14.2	2.872	0.837	1.436	0.374	4.1	7	3.04	0.019
IT	1998	tassel peduncle length (cm)	PH1MR	PHR31	5	5	22.0	19.4	1.414	1.342	0.632	0.600	2.6	8	2.98	0.018
AD	1998	tassel primary branch (# of primary branches)	PH1MR	PHR31	4	5	6.8	11.6	2.062	2.510	1.031	1.122	-4.9	7	-3.11	0.017
IT	1998	tassel primary branch (# of primary branches)	PH1MR	PHR31	5	5	5.0	9.6	2.236	1.140	1.000	0.510	-4.6	8	-4.10	0.003

Table 1B. Summary data broken out across environments in 1998.

year	Trait	variety-1	variety-2	Count-1	Count-2	Mean-1	Mean-2	StdDeviation-1	StdDeviation-2	StdError-1	StdError-2	Mean Diff	DF Pooled	t-Value Pooled	Prob (2-tail) Pooled
1998	husk extension length (cm)	PH1MR	PHR31	10	10	1.6	3.9	1.350	0.994	0.427	0.314	-2.3	18	-4.34	0.000
1998	tassel peduncle length (cm)	PH1MR	PHR31	9	10	20.3	16.8	2.828	2.936	0.943	0.929	3.5	17	2.66	0.016
1998	tassel primary branch (# of primary branches)	PH1MR	PHR31	9	10	5.8	10.6	2.224	2.119	0.741	0.670	-4.8	17	-4.84	0.000

9900375

Exhibit B. Novelty Statement Tables

Table 2. These data indicate differences between varieties PH1MR and PHR31. Data are from multiple locations and years grown primarily in the adapted growing area.

Variety 1 = PH1MR
Variety 2 = PHR31

		GDU	GDU
	VAR	SHD	SLK
YEAR	#	ABS	ABS
---	---	---	---
1995	1	1600	1660
	2	1460	1480
	LOCS	1	1
	PROB	0	0
1996	1	1250	1296
	2	1324	1348
	LOCS	5	5
	PROB	* .008#	.020+
1997	1	1273	1313
	2	1392	1422
	LOCS	15	15
	PROB	.000#	.000#
1998	1	1252	1300
	2	1379	1419
	LOCS	14	14
	PROB	.000#	.000#
TOTAL SUM	1	1270	1315
	2	1379	1412
	LOCS	35	35
	DIFF	109	97
	PROB	+ .000#	.000#

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

9900375

Objective Description of Variety
Corn (Zea mays L.)

Name of Applicant (s)	Variety Seed Source	Variety Name or Temporary Designation
Pioneer Hi-Bred International, Inc.		PH1MR
Address (Street & No., or RFD No., City, State, Zip Code and Country		FOR OFFICIAL USE
7301 NW 62nd Avenue, P.O. Box 85, Johnston, Iowa 50131-0085		PVP0 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 an '*' 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 #25 and #26 in Comments section):

01=Light Green	06=Pale Yellow	11=Pink	16=Pale Purple	21=Buff
02=Medium Green	07=Yellow	12=Light Red	17=Purple	22=Tan
03=Dark Green	08=Yellow Orange	13=Cherry Red	18=Colorless	23=Brown
04=Very Dark Green	09=Salmon	14=Red	19=White	24=Bronze
05=Green-Yellow	10=Pink-Orange	15=Red & White	20=White Capped	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:		Yellow Dent (Unrelated):	Sweet Corn:
Family	Members	Co109, ND246,	C13, Iowa5125, P39, 2132
B14	CM105, A632, B64, B68	Oh7, T232,	
B37	B37, B76, H84	W117, W153R,	Popcorn:
B73	N192, A679, B73, NC268	W18BN	SG1533, 4722, HP301, HP7211
C103	Mo17, Va102, Va35, A682		
Oh43	A619, MS71, H99, Va26	White Dent:	Pipecorn:
WF9	W64A, A554, A654, Pa91	C166, H105, Ky228	Mo15W, Mo16W, Mo24W

Ceres/worddata/doug/96pvp

8

9900375

EXHIBIT C: PH1MR

1. TYPE: (describe intermediate types in Comments section):	Standard Variety Name
2 1=Sweet 2=Dent 3=Flint 4=Flour 5=Pop 6=Ornamental	W64A
2. REGION WHERE DEVELOPED IN THE U.S.A.:	Standard Seed Source
2 1=Northwest 2=Northcentral 3=Northeast 4=Southeast 5=Southcentral 6=Southwest 7=Other	AMES 19291

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

DAYS	HEAT UNITS		DAYS	HEAT UNITS
069	1,270.2	From emergence to 50% of plants in silk	070	1,293.1
069	1,270.5	From emergence to 50% of plants in pollen	069	1,275.0
004	0,094.3	From 10% to 90% pollen shed	004	0,089.9
		From 50% silk to optimum edible quality		
073	1,416.7	From 50% silk to harvest at 25% moisture	071	1,421.3

4. PLANT:

		Standard Deviation	Sample Size		Standard Deviation	Sample Size
214.8	cm Plant Height (to tassel tip)	13.20	06	181.7	23.87	07
080.3	cm Ear Height (to base of top ear node)	14.04	06	069.6	17.79	07
015.5	cm Length of Top Ear Internode	02.97	06	013.9	03.01	07
0.0	Average Number of Tillers	00.01	07	0.0	00.05	07
1.1	Average Number of Ears per Stalk	00.38	07	1.0	00.00	07
2	Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate 4=Dark			4		

5. LEAF:

		Standard Deviation	Sample Size		Standard Deviation	Sample Size
08.0	cm Width of Ear Node Leaf	00.74	06	09.0	01.02	07
79.5	cm Length of Ear Node Leaf	09.48	06	68.4	07.30	07
05	Number of leaves above top ear	00.58	06	05	00.60	07
41	Degrees Leaf Angle (measure from 2nd leaf above ear at anthesis to stalk above leaf)	10.44	06	38	07.11	07
03	Leaf Color (Munsell code) 5GY34			03	5GY44	
1	Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)			1		
7	Marginal Waves (Rate on scale from 1=none to 9=many)			6		
7	Longitudinal Creases (Rate on scale from 1=none to 9=many)			6		

6. TASSEL:

		Standard Deviation	Sample Size		Standard Deviation	Sample Size
06	Number of Primary Lateral Branches	01.43	05	05	01.79	07
34	Branch Angle from Central Spike	10.90	05	20	04.89	07
58.7	cm Tassel Length (from top leaf collar to tassel tip)	02.18	05	50.3	03.96	07
6	Pollen Shed (rate on scale from 0=male sterile to 9=heavy shed)			6		
07	Anther Color (Munsell code) 7.5Y88			07	10Y8.58	
01	Glume Color (Munsell code) 5GY76			01	5GY66	
1	Bar Glumes (Glume Bands): 1=Absent 2=Present			1		

9

9900375

7a. EAR (Unhusked Data):				
01	Silk Color (3 days after emergence) (Munsell code)	5GY88	07	2.5GY96
01	Fresh Husk Color (25 days after 50% silking) (Munsell code)	5GY68	01	5GY78
21	Dry Husk Color (65 days after 50% silking) (Munsell code)	2.5Y84	21	2.5Y8.54
2	Position of Ear at Dry Husk Stage: 1= Upright 2= Horizontal 3= Pendant		3	
4	Husk Tightness (Rate of Scale from 1=very loose to 9=very tight)		7	
2	Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium (<8 cm) 3=Long (8-10 cm beyond ear tip) 4=Very Long (>10 cm)		2	

7b. EAR (Husked Ear Data):		Standard Deviation	Sample Size	Standard Deviation		Sample Size
16.3	cm Ear Length	01.11	07	14.1	01.35	07
42.0	mm Ear Diameter at mid-point	01.29	07	41.9	02.41	07
118.9	gm Ear Weight	22.32	07	96.0	23.91	07
13	Number of Kernel Rows	00.69	07	17.0	01.15	07
2	Kernel Rows: 1=Indistinct 2=Distinct			2		
1	Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral			1		
14.0	cm Shank Length	01.63	07	11.4	02.64	07
2	Ear Taper: 1=Slight 2= Average 3=Extreme			2		

8. KERNEL (Dried)		Standard Deviation	Sample Size	Standard Deviation		Sample Size
10.0	mm Kernel Length	00.58	07	09.7	00.76	07
08.7	mm Kernel Width	00.49	07	06.9	00.38	07
04.7	mm Kernel Thickness	00.49	07	04.1	00.38	07
30.6	% Round Kernels (Shape Grade)	10.45	05	16.9	17.07	07
1	Aleurone Color Pattern: 1-Homozygous 2=Segregating			1		
07	Aluerone Color (Munsell code)	1.25Y812		07	2.5Y812	
07	Hard Endosperm Color (Munsell code)	1.25Y812		07	10YR814	
03	Endosperm Type: 1=Sweet (Su1) 2=Extra Sweet (sh2) 3=Normal Starch 4=High Amylose Starch 5=Waxy Starch 6=High Protein 7=High Lysine 8=Super Sweet (se) 9=High Oil 10=Other_____			3		
28.1	gm Weight per 100 Kernels (unsized sample)	03.53	07	20.57	03.78	07

9. COB:		Standard Deviation	Sample Size	Standard Deviation		Sample Size
24.7	mm Cob Diameter at mid-point	00.95	07	27.3	01.25	07
14	Cob Color (Munsell code) 10R48			14	2.5YR56	

10

10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested; leave Race or Strain Options blank if polygenic):

	A. Leaf Blights, Wilts, and Local Infection Diseases	
	Anthracnose Leaf Blight (Colletotrichum graminicola)	
	Common Rust (Puccinia sorghi)	
	Common Smut (Ustilago maydis)	
	Eyespot (Kabatiella zeae)	
	Goss's Wilt (Clavibacter michiganense spp. nebraskense)	
4	Gray Leaf Spot (Cercospora zeae-maydis)	2
	Helminthosporium Leaf Spot (Bipolaris zeicola) Race ———	
4	Northern Leaf Blight (Exserohilum turcicum) Race ———	5
	Southern Leaf Blight (Bipolaris maydis) Race ———	
	Southern Rust (Puccinia polysora)	
	Stewart's Wilt (Erwinia stewartii)	
	Other (Specify) ———	
	B. Systemic Diseases	
	Corn Lethal Necrosis (MCMV and MDMV)	
8	Head Smut (Sphacelotheca reiliana)	8
	Maize Chlorotic Dwarf Virus (MDV)	
	Maize Chlorotic Mottle Virus (MCMV)	
	Maize Dwarf Mosaic Virus (MDMV)	
	Sorghum Downy Mildew of Corn (Peronosclerospora sorghi)	
	Other (Specify) ———	
	C. Stalk Rots	
	Anthracnose Stalk Rot (Colletotrichum graminicola)	
	Diplodia Stalk Rot (Stenocarpella maydis)	
	Fusarium Stalk Rot (Fusarium moniliforme)	
	Gibberella Stalk Rot (Gibberella zeae)	
	Other (Specify) ———	
	D. Ear and Kernel Rots	
	Aspergillus Ear and Kernel Rot (Aspergillus flavus)	
	Diplodia Ear Rot (Stenocarpella maydis)	
	Fusarium Ear and Kernel Rot (Fusarium moniliforme)	
	Gibberella Ear Rot (Gibberella zeae)	
	Other (Specify) ———	

11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); (leave blank if not tested) :

	Banks grass Mite (Oligonychus pratensis)	
	Corn Worm (Helicoverpa zea)	
	Leaf Feeding	
	Silk Feeding	
	mg larval wt.	
	Ear Damage	
	Corn Leaf Aphid (Rhopalosiphum maidis)	
	Corn Sap Beetle (Carpophilus dimidiatus	
	European Corn Borer (Ostrinia nubilalis)	
7	1st Generation (Typically Whorl Leaf Feeding)	3
	2nd Generation (Typically Leaf Sheath-Collar Feeding)	
	Stalk Tunneling	
	cm tunneled/plant	
	Fall Armyworm (Spodoptera fruqiperda)	
	Leaf Feeding	
	Silk Feeding	
	mg larval wt.	
	Maize Weevil (Sitophilus zeamaize	
	Northern Rootworm (Diabrotica barberi)	
	Southern Rootworm (Diabrotica undecimpunctata)	
	Southwestern Corn Borer (Diatreaea grandiosella)	
	Leaf Feeding	
	Stalk Tunneling	
	cm tunneled/plant	
	Two-spotted Spider Mite (Tetranychus urticae)	
	Western Rootworm (Diabrotica virgifrea virgifera)	
	Other (Specify) ———	

12. AGRONOMIC TRAITS:

4	Staygreen (at 65 days after anthesis) (Rate on a scale from 1=worst to excellent)	3
0.8	% Dropped Ears (at 65 days after anthesis)	0.0
	% Pre-anthesis Brittle Snapping	
	% Pre-anthesis Root Lodging	
8.2	Post-anthesis Root Lodging (at 65 days after anthesis)	3.8
3,840.0	Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture)	2,797.5

13. MOLECULAR MARKERS: (0=data unavailable; 1=data available but not supplied; 2=data supplied):

1 Isozymes 0 RFLP's 0 RAPD's

COMMENTS (eg. state how heat units were calculated, standard inbred seed source, and/or where data was collected. Continue in Exhibit D):

10

CLARIFICATION OF DATA IN EXHIBITS B AND C

Please note the data presented in Exhibit C, "Objective Description of Variety," are collected primarily at Johnston and Ankeny, Iowa. The data in Exhibit B are from comparisons of inbreds grown in the same tests in the adapted growing area of PH1MR and in Johnston and Ankeny, Iowa. The data in Tables 1A and 1B are from paired comparisons collected in Johnston and Ankeny, Iowa. The data in Table 2 are from paired comparisons grown primarily in the adapted growing area of PH1MR. These traits collectively show distinct differences between the two varieties.

GMS 8/16/01

The data collected in exhibit C were collected in 1996, 1997 and 1998 for page 1 and 2. There are environmental factors that differ from year to year and environment to environment. The environments had different planting dates within each year. Environmental temperature and precipitation differences during the vegetative and grain fill periods can impact plant and grain traits and be a source of variability. These data are mostly based on 5 plants measured at each location. There often is more variability associated with year to year factors than from location to location or within locations. Please see Table 3 for average temperature and rainfall information in 1996, 1997 and 1998.

9900375

Table 3. Temperature and Rainfall

TEMPERATURE

YEAR	MAY	JUN	JULY	AUG	AVERAGE
1994	59.8	70.7	71.9	69.0	**67.9**
1995	56.2	69.4	74.3	76.9	**69.2**
1996	56.2	69.3	71.3	70.5	**66.8**
1997	53.5	70.6	74.1	69.6	**67.0**
1998	64.7	66.6	74.8	73.5	**69.9**
1999	60.7	69.7	78.7	70.5	**69.9**

RAINFALL

YEAR	MAY	JUN	JULY	AUG	Total
1994	3.67	5.75	1.71	4.18	**15.31**
1995	5.04	4.19	2.94	2.87	**15.04**
1996	8.47	4.35	2.51	2.14	**17.47**
1997	4.32	3.27	4.10	1.36	**13.05**
1998	6.46	11.07	5.70	4.96	**28.19**
1999	6.46	4.54	4.45	6.55	**21.85**

Additional Paired Comparison Data

Variety 1	PH1MR													
Variety 2	PHR31													
		BAR	DRP	TEX	EAR	TAS	ECB	STA	BU	GQU	MST	SDG	TIL	GDU
	VAR	PLT	EAR	EAR	MLD	BRN	1LF	GRN	ACR	/HA		VGR	LER	SHD
YEAR	#	ABS	ABS	ABS	ABS	ABS	ABS	ABS	%MN	ABS	ABS	ABS	ABS	ABS
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1995	1						8.0					1.0	0.0	1600
	2						6.0					5.0	0.0	1460
	LOCS						1					1	1	1
	PROB													0
1996	1			3.0	9.0							4.0	19.2	1250
	2			3.0	9.0							5.0	10.7	1324
	LOCS			1	1							1	3	5
	PROB												0.063	* .008#
1997	1	100.0	100.0	3.0	9.0			3.0	117.0	41.2	13.0	7.0	0.0	1273
	2	100.0	100.0	4.0	9.0			3.8	110.0	38.6	12.7	6.3	0.0	1392
	LOCS	2	1	1	1			4	4	4	4	4	6	15
	PROB	1						0.215	0.436	0.427	0.287	0.391	1	.000#
1998	1	99.0				4.0		3.5	112.0	46.7	14.9	5.0	1.9	1252
	2	95.1				7.0		4.0	119.0	49.5	16.6	5.3	0.0	1379
	LOCS	6				1		2	2	2	2	4	6	14
	PROB	0.153						0.5	0.618	0.624	0.16	0.638	0.175	.000#
TOTAL SU	1	99.3	100.0	3.0	9.0	4.0	8.0	3.2	115.0	43.0	13.6	5.3	4.3	1270
	2	96.3	100.0	3.5	9.0	7.0	6.0	3.8	113.0	42.3	14.0	5.6	2.0	1379
	LOCS	8	1	2	2	1	1	6	6	6	6	10	16	35
	DIFF	2.9	0	0.5	0	3	2	0.7	2	0.7	0.4	0.3	2.3	108
	PROB	0.15		0.5	1			0.102	0.76	0.766	0.401	0.604	0.031	+ .000#

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Additional Paired Comparison Data

Variety 1	PH1MR												
Variety 2	PHR31												
		GDU	POL	TAS	PLT	EAR	RT	STK	BRT	SCT	NLF	FUS	COM
	VAR	SLK	SC	SZ	HT	HT	LDG	LDG	STK	GRN	BLT	ERS	RST
YEAR	#	ABS	ABS	ABS	ABS	ABS	ABS	ABS	ABS	ABS	ABS	ABS	ABS
---	---	---	---	---	CM	CM	---	---	---	---	---	---	---
1995	1	1660			152.4	45.7							
	2	1480			190.5	91.4							
	LOCS	1			1	1							
	PROB	0			0	0							
1996	1	1296	4.0	5.3	194.3	86.4				7.0	3.0		6.0
	2	1348	5.5	6.5	196.9	86.4				7.0	2.0		6.5
	LOCS	5	2	4	2	1				1	1		2
	PROB	.020+	0.205	.080*	0.799	0							0.5
1997	1	1313	7.0	5.1	217.9	75.2	100.0	93.2		7.0			5.0
	2	1422	7.0	6.4	205.2	76.7	100.0	76.1		9.0			5.0
	LOCS	15	1	9	5	5	4	1		1			1
	PROB	.000#		.000#	.073*	0.76	1						
1998	1	1300		5.5	210.6	71.1			86.3			1.0	
	2	1419		6.0	214.4	86.9			89.4			1.0	
	LOCS	14		10	4	4			1			2	
	PROB	.000#		0.177	0.476	.034+						1	
TOTAL SU	1	1315	5.0	5.3	206.0	72.1	100.0	93.2	86.3	7.0	3.0	1.0	5.7
	2	1412	6.0	6.3	205.7	82.6	100.0	76.1	89.4	8.0	2.0	1.0	6.0
	LOCS	35	3	23	12	11	4	1	1	2	1	2	3
	DIFF	97	1	1	0.508	10.668	0	17.1	3.1	1	1	0	0.3
	PROB	.000#	0.225	.000#	0.932	.051*	1			0.5		1	0.423

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U. S. C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

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)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
PIONEER HI-BRED INTERNATIONAL, INC.		**PH1MR**

4 .ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*	5. TELEPHONE *(include area code)*	6. FAX *(include area code)*
7301 NW 62nd AVENUE **P.O.BOX 85** **JOHNSTON, IA 50131-0085**	**515-270-4051** 7. PVPO NUMBER	**515-253-2125**

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block.* **If no, please explain** ☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? ☒ YES ☐ NO

If no, give name of country

10. Is the applicant the original owner? ☒ YES ☐ NO ***If no, please answer one of the following:***

a. If original rights to variety were owned by individual(s), is(are) the original owner(s) a U.S. national(s)?

☐ YES ☐ NO **if no, give name of country**

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

☒ YES ☐ NO **If no, give name of country**

11. Additional explanation on ownership *(if needed, use reverse for extra space)*:

PH1MR is owned by Pioneer Hi-Bred International, Inc.

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country Which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are 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 compete this information collection is estimated to average 10 minutes 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.

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