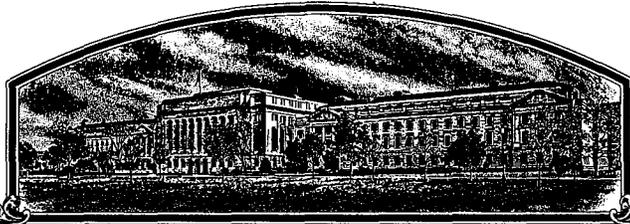


No.

9200089



# 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 NOVEL VARIETY OF SEXUALLY REPRODUCED 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 *eighteen* 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, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (ACT, 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'PHR30'

*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 30th day of June in the year of our Lord one thousand nine hundred and ninety-two.*

*Attest:*

*Kenneth Evans*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

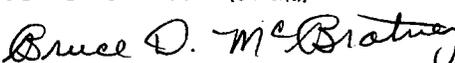
*Edward Madison*  
Secretary of Agriculture



U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

**APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE**  
(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 242). Information is held confidential until a 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 NO.	3. VARIETY NAME  PHR30
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP)  Plant Breeding Division North America Department of Corn Breeding P.O. Box 85 Johnston, IA 50131-0085		5. PHONE (Include area code)  515/270-3300	<b>FOR OFFICIAL USE ONLY</b> PVPO NUMBER  9200089
6. GENUS AND SPECIES NAME  Zea mays	7. FAMILY NAME (Botanical)  Gramineae		FILING Date: <u>Jan. 31, 1992</u> Time: <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.
8. CROP KIND NAME (Common Name)  Corn	9. DATE OF DETERMINATION  November 1986		FEE S Filing and Examination Fee. \$ <u>250.-</u> Date: <u>Jan. 31, 1992</u>
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.)  Corporation			RECEIVED Certificate Fee. \$ <u>250.-</u> Date: <u>June 15, 1992</u>
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. Bruce D. McBratney Plant Breeding Division Pioneer Hi-Bred International, Inc. P.O. Box 85 Johnston, IA 50131-0085			PHONE (Include area code): 515/270-3546
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)			
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety.			
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement.			
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety			
d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety.			
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership.			
f. <input checked="" type="checkbox"/> Seed Sample (2,500 viable untreated seeds) Date Seed Sample mailed to Plant Variety Protection Office <u>1-29-92</u>			
g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."			
15. DOES THE APPLICANT(S) 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.)			
<input type="checkbox"/> YES (If "YES," answer items 16 and 17 below)			
<input checked="" type="checkbox"/> NO (If "NO," skip to item 18 below)			
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?	
<input type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?			
<input type="checkbox"/> YES (If "YES," through <input type="checkbox"/> Plant Variety Protection Act <input type="checkbox"/> Patent Act Give date: _____)			
<input checked="" type="checkbox"/> NO			
19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?			
<input type="checkbox"/> YES (If "YES," give names of countries and dates)			
<input checked="" type="checkbox"/> NO			
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.  The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believes that the variety is distinct, uniform, and stable as required in 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))  Pioneer Hi-Bred International, Inc.		CAPACITY OR TITLE	DATE
SIGNATURE OF APPLICANT (Owner(s))  		CAPACITY OR TITLE  Technical Support Coordinator	DATE  1-28-92

## 14A. Exhibit A. Origin and Breeding History

Pedigree: PHFM5/PHG47)XA4K1232K3X

Pioneer Line PHR30 Zea mays L., a yellow corn inbred, was developed by Pioneer Hi-Bred International, Inc. from the single cross PHFM5 x PHG47 using the pedigree method of breeding. The progenitors of PHR30 are proprietary inbred lines of Pioneer Hi-Bred International, Inc. Selfing and selection were practiced within the above F1 cross for 6 generations in the development of PHR30 at Mankato, Minnesota. During line development, crosses were made to inbred testers for the purpose of estimating the line's combining ability. Yield trials were grown at Mankato, Minnesota, as well as other Pioneer research stations. After initial testing, additional hybrid combinations have been evaluated and subsequent generations of the line have been grown and hand-pollinated with observations made for uniformity.

SMS  
6/15/92

PHR30 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 a sufficient number of generations with careful attention paid to 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.

No variant traits have been observed or are expected in PHR30.

## DEVELOPMENTAL HISTORY FOR PHR30

SEASON/YEAR	INBREEDING LEVEL
Winter 1980	F0 (Cross Made)
Winter 1981	F1
Summer 1982	F2
Winter 1983	F3
Summer 1983	F4
Summer 1984	F5
Summer 1985	F6
Winter 1986	F7*
Summer 1986	F8
Summer 1987	F9**

\* PHR30 was selfed and selected through F7 generation.

\*\*PHR30 was selfed and ear-rowed F8 and F9 generations.

## 14B. Exhibit B. Novelty Statement

PHR30 is most similar to the Pioneer Hi-Bred International, Inc. proprietary inbred line PHG47 (PVP Certification No. 8600131). PHR30 silks approximately 40 (1400 versus 1360) growing degree units later than PHG47. PHR30 has darker (dark versus medium) green leaves, more (many versus none) marginal leaf waves and more (many versus absent) longitudinal leaf creases than PHG47. PHR30 has fewer (5 versus 11) lateral tassel branches than PHG47. PHR30 has yellow anthers whereas PHG47 has green anthers. PHR30 has light green fresh husk color and an upright ear shank, PHG47 has a dark green fresh husk color and horizontal ear shank. The cob color of PHR30 is red whereas PHG47 has a white cob.

PHR30 outyields PHG47. PHR30 is a taller inbred with higher ear placement and fewer barren plants than PHG47. PHR30 has better seedling vigor and a higher early stand count than PHG47. PHR30 has fewer brittle stalks but is more susceptible to stalk and root lodging than PHG47.



## E. Ear (Husked Ear Data Except When Stated Otherwise):

Length: 14 cm  
 Weight: 92 gm  
 Mid-point Diameter: 38 mm  
 Silk Color: Yellow  
 Husk Extension (Harvest stage): Medium (Barely Covering Ear)  
 Husk Leaf: Long (> 15 cm)  
 Taper of Ear: Slight  
 Position of Shank (dry husks): Upright  
 Kernel Rows: Straight, Distinct Number = 14  
 Husk Color (fresh): Light Green  
 Husk Color (dry): Buff  
 Shank Length: 13 cm  
 Shank (No. of internodes): 10

## F. Kernel (Dried):

Size (from ear mid-point)  
     Length: 10 mm  
     Width: 8 mm  
     Thick: 5 mm  
 Shape Grade (% rounds): 20-40 (29% medium round based on Parent Test Data)  
 Pericarp Color: Colorless  
 Aleurone Color: Homozygous Yellow  
 Endosperm Color: Yellow  
 Endosperm Type: Normal Starch  
 Gm Wt/100 Seeds (unsized): 23 gm

## G. Cob:

Diameter at mid-point: 22 mm  
 Strength: Strong  
 Color: Red

## H. Diseases:

Corn Lethal Necrosis (MCMV=Maize Chlorotic Mottle Virus and MDMV=Maize Dwarf Mosaic Virus): Intermediate  
 N. Leaf Blight (turcicum): Susceptible  
 Common Rust (sorghii): Intermediate  
 Eye Spot (zeae): Intermediate  
 Gray Leaf Spot (zeae): Susceptible  
 Stewart's Wilt (stewartii): Susceptible  
 Goss's Wilt (nebraskense): Intermediate  
 Fusarium Ear Mold (moniliforme) Resistant

## I. Insects:

European Corn Borer-1 Leaf Damage (Pre-flowering): Intermediate  
 European Corn Borer-2 (Post-flowering): Susceptible

The above descriptions are based on a scale of 1-9, 1 being highly susceptible, 9 being highly resistant.

S (Susceptible): Would generally represent a score of 1-3.

I (Intermediate): Would generally represent a score of 4-5.

R (Resistant): Would generally represent a score of 6-7.

H (Highly Resistant): Would generally represent a score of 8-9. Highly resistant does not imply the inbred is immune.

## J. Variety Most Closely Resembling:

Character	Inbred
Maturity	PHG47
Usage	PHG47

PHG47 (PVP Certificate No. 8600131) is a Pioneer Hi-Bred International, Inc. proprietary inbred.

Data for Items B, C, D, E, F, and G is based primarily on a maximum of eight reps from Johnston, Iowa grown in 1988, 1989, 1990 and 1991, plus description information from the maintaining station.

14D. EXHIBIT D. ADDITIONAL DESCRIPTION OF PHR30.  
 INBRED PER SE YIELD TEST COMPARISON OF PHR30 AND PHG47 EVALUATED OVER THREE YEARS.

VARIETY #1 - PHR30  
 VARIETY #2 - PHG47

\* = 10% SIG + = 5% SIG # = 1% SIG

YEAR	VAR #	BU ACR	BU ACR	MST	BAR	PLT	EAR	SDG	EST	DRP	GDU	GDU	GRN	STA	STK	RT	BRT
		ABS	%MN	ABS	ABS	ABS	ABS	ABS	ABS	ABS	SHD	SLK	APP	GRN	LDG	LDG	STK
											ABS	ABS	ABS	ABS	ABS	ABS	ABS
89	1	79.3	99	30.0	100.0	198.9	78.7	5.6	28.9	100.0	1312	1353	4.3	3.3	100.0	87.8	
	2	52.5	66	27.7	72.0	159.7	52.4	4.0	29.3	100.0	1337	1365	4.3	1.3	99.4	100.0	
	LOCS	1	1	1	1	10	9	15	20	1	20	19	1	3	1	3	
	REPS	3	3	3	1	12	11	18	45	3	23	20	3	3	3	3	
	PROB					.003#	.002#	.000#	.774		.036+	.389		.184		.276	
90	1				97.1	188.4	63.1	4.5	27.9		1334	1369		2.3	51.5	53.3	100.0
	2				85.9	144.7	36.5	3.5	23.7		1357	1382		1.3	56.5	100.0	90.9
	LOCS				3	8	8	12	25		20	18		4	4	1	1
	REPS				3	17	17	13	57		31	28		4	8	1	1
	PROB				.159	.000#	.000#	.039+	.000#		.113	.464		.252	.767		
91	1	61.8	103	17.5	96.1	186.5	67.0	5.7	29.7		1347	1377		4.4	97.5	47.3	
	2	39.9	66	18.2	85.6	152.8	41.1	4.9	28.3		1341	1362		3.4	97.0	97.6	
	LOCS	3	3	3	10	9	9	14	22		16	16		6	2	3	
	REPS	12	12	12	18	14	15	19	51		20	19		13	8	7	
	PROB	.022+	.000#	.426	.049+	.001#	.002#	.028+	.061*		.415	.068*		.111	.816	.104	
TOTAL SUM	1	66.2	102	20.6	96.6	191.7	69.9	5.3	28.8	100.0	1330	1366	4.3	3.5	71.5	65.5	100.0
	2	43.1	66	20.5	84.7	153.0	43.6	4.1	26.9	100.0	1345	1370	4.3	2.3	74.2	99.0	90.9
	LOCS	4	4	4	14	27	26	41	67	1	56	53	1	13	7	7	1
	REPS	15	15	15	22	43	43	50	153	3	74	67	3	20	19	11	1
	DIFF	23.1	36	0.1	11.9	38.7	26.3	1.2	1.9	0.0	15	04	0.0	1.2	2.6	33.4	9.1
	PROB	.003#	.000#	.917	.006#	.000#	.000#	.000#	.004#		.026+	.611		.007#	.764	.019+	

8

DEFINITIONS

In the description and examples, 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:

BAR PLT = BARREN PLANTS. This is the percent of plants per plot that were not barren (lack ears).

BRT STK = BRITTLE STALKS. This is a measure of the stalk breakage near the time of pollination, and is an indication of whether a hybrid or inbred would snap or break near the time of flowering under severe winds. Data are presented as percentage of plants that did not snap.

BU ACR = YIELD (BUSHEL/ACRE). Actual yield of the grain at harvest adjusted to 15.5% moisture. ABS is in absolute terms and % MN is percent of the mean for the experiments in which the hybrid or inbred was grown.

DRP EAR = DROPPED EARS. This is a measure of the number of dropped ears per plot and represents the percentage of plants that did not drop ears prior to harvest.

EAR HCM = EAR HEIGHT. The ear height is a measure from the ground to the top developed ear node attachment and is measured in centimeters.

EST CNT = EARLY STAND COUNT. This is a measure of the stand establishment in the spring and represents the number of plants that emerge on a per plot basis for the hybrid or inbred.

GDU SHD = GDU TO SHED. The number of growing degree units (GDUs) or heat units required for an inbred line or hybrid to have approximately 50 percent of the plants shedding pollen and is measured from the time of planting. Growing degree units are calculated by the Barger Method, where the heat units for a 24-hour period are:

$$\text{GDU} = \frac{(\text{Max. temp.} + \text{Min. temp.})}{2} - 50$$

The highest maximum temperature used is 86°F and the lowest minimum temperature used is 50°F. For each inbred or hybrid it takes a certain number of GDUs to reach various stages of plant development.

GDU SLK = GDU TO SILK. The number of growing degree units required for an inbred line or hybrid to have approximately 50 percent of the plants with silk emergence from time of planting. Growing degree units are calculated by the Barger Method as given in GDU SHD definition.

GRN APP. = GRAIN APPEARANCE. This is a 1 to 9 rating for the general quality of the shelled grain as it is harvested based on such factors as the color of the harvested grain, any mold on the grain, and any cracked grain. High scores indicate good grain quality and low scores indicate poor grain quality.

MST = HARVEST MOISTURE. The moisture is the actual percentage moisture of the grain at harvest.

PLT HCM = PLANT HEIGHT. This is a measure of the height of the plant from the ground to the tip of the tassel in centimeters.

RT LDG = ROOT LODGING. Root lodging is the percentage of plants that do not root lodge; plants that lean from the vertical axis at an approximately 30° angle or greater would be counted as root lodged.

SDG VGR = SEEDLING VIGOR. This is the visual rating (1 to 9) of the amount of vegetative growth after emergence at the seedling stage (approximately five leaves). A higher score indicates better vigor and a low score indicates poorer vigor.

STA GRN = 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.

STK LDG = STALK LODGING. This is the percentage of plants that did not stalk lodge (stalk breakage) as measured by either natural lodging or pushing the stalks and determining the percentage of plants that break below the ear.

TST WT = TEST WEIGHT UNADJUSTED. The measure of weight of the grain in pounds for a given volume (bushel).

## CLARIFICATION OF DATA IN EXHIBITS C AND D

Please note the data presented in Exhibit C, "Objective Description of Variety," is data collected primarily at Johnston, Iowa plus description information from the maintaining station. The data in Exhibit D, "Additional Description of Variety," is data from comparisons of inbreds grown in the same tests in the adapted growing area of PHR30.

## 14E. EXHIBIT E. Statement of the Basis of Applicant's Ownership

Pioneer Hi-Bred International, Inc., Des Moines, Iowa, is the employer of the plant breeders involved in the development and evaluation of PHR30. Pioneer Hi-Bred International, Inc. has the sole rights and ownership of PHR30.