9300087

<u>THE CONTRESION STRATES OF ANTERRICA</u>

TO) ALL, TO) WHOM: THESE; PRESENTS: SHALL, COME;

BEKATO Plant Genetics

Thereas, 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 APPLI-CANT(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 EX-CLUDE 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 LETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT ${f V}$ ARIETY ${f P}$ ROTECTION ${f A}$ CT [. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'311H6'

In Testimony Winexcot, I have hereunto set my hand and caused the seal of the Plant Tariety Protection Office to be affixed at the City of Washington, D.C.

this 31st day of March the year of our Lord one thousand nine

hundred and ninety-four.

who accounts to the same and the same

Plant Variety Protection Office

Agricultural Marketing Service

Fublic reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gatherin, and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Office, OIRM, Room 404-W, Washington, D. C. 20250; and to the Office of Management and Budget, Paperwork Reduction Project (OMB #0581-0055), Washington, 20250.

FORM APPROVED: OMB 0581-0055, Expires 1/31/91

U.S. DEPARTMENT OF A AGRICULTURAL MARKE	Application is required in order determine if a plant variety protecti					
APPLICATION FOR PLANT VARIET	certificate is to be issued (7 U.S.C. 242 Information is held confidential ur certificate is issued (7 U.S.C. 2426).					
NAME OF APPLICANT(S) (as it is to appear on the Certificate)		2. TEMPORARY DESIGNATION OR	3. V	ARIETY NAME		
DEKALB PLANT GENETICS		EXPERIMENTAL NO.	31	I IH6		
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP)		5. PHONE (Include area code)		FOR OFFICIAL USE ONLY		
3100 SYCAMORE ROAD			PVPO	PVPO NUMBER		
DEKALB, IL 60115		815/756-7333		9300087		
	,		F	Date		
			i	January 14, 1993		
6. GENUS AND SPECIES NAME	7. FAMILY NAME (Botan	ical)	N	Time		
ZEA MAYS	GRAMINEA		G	A.MP.N		
8. CROP KIND NAME (Common Name)	9.	DATE OF DETERMINATION	F	Filing and Examination Fee:		
Corn	1	SUMMER 1988	E	\$ 2150.00		
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGA	NIZATION (Corporation, pa	Inership, association, etc.)	R	January 14, 1993		
PARTNERSHIP			E C	Certificate Fee:		
			E	\$250.00		
11. IF INCORPORATED, GIVE STATE OF INCORPORATION	12. D	ATE OF INCORPORATION	Į.	Date		
			E	March 14, 1994		
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS ROBERT E. ROMAN, JR., ASSISTANT GENERAL COUNSEL DEKALB GENETICS CORPORATION 3100 SYCAMORE ROAD DEKALB, IL 60115 10. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse) a. DESCRIPTION OF SEACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse) b. DESCRIPTION OF SEACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse) c. DESCRIPTION OF SEACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse) d. DESCRIPTION OF SEACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse) e. DESCRIPTION OF SEACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse) e. DESCRIPTION OF SEACH 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 ACL) TYES (If "YES," answer items 16 and 17 below) NO (If "NO," skip to item 18 below) 16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? THE YES NO RECEIVED THAT THIS VARIETY BE LIMITED AS TO SUMMER OF GENERATIONS? POUNDATION REGISTERED CERTIFIED						
YES (# "YES," through Plant Variety Protection Act	Patent Act. Give d	ite:				
□ No		, <u></u> ,				
19 HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR M	MARKETED IN THE U.S. OR	OTHER COUNTRIES?				
YES (II "YES," give names of countries and dates) NO						
20. The applicant(s) declare(s) that a viable sample of basic se		l be furnished with the application	n and	will be replenished upon		
request in accordance with such regulations as may be appl The undersigned applicant(s) is (are) the owner(s) of this uniform, and stable as required in section 41, and is entitle	sexually reproduced	novel plant variety, and believe he provisions of section 42 of the F	(s) the Plant V	at the variety is distinct, Variety Protection Act.		
Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.						
SIGNATURE OF APPLICANT [Owner(s)]	CAPACITY OR	TITLE	D	ATE		
Thomas B. Paris	PRI	ESIDENT		1/5/93		
SIGNATURE OF APPLICANT [Owner(s)]	CAPACITY OR	TITLE	۰۵	ATE		

9300087

Origin and Breeding History 3IIH6

3IIH6 was selected for silking under high population density, resistance to northern corn leaf blight, and staygreen.

Summer 1984	Pioneer	3737	was	self-pollinated.	Seed	was	bulked
	(Nursery	row	numbe	r 84:3848).			

Summer 1985 Bulked S1 seed was grown (Nursery row numbers 87-31 through 87-45).

Winter 1985/86 S2 seed was grown ear-to-row.

Summer 1986 S3 seed was grown ear-to-row (Nursery row numbers 21-43 through 21-74).

Winter 1986/87 S4 seed was grown ear-to-row (Nursery row numbers 89-151 through 89-162).

Summer 1987 S5 seed was grown ear-to-row (Nursery row numbers 109-45 through 109-60). Row number 109-47 was coded 3IIH6.

Summer 1988 S6 seed was grown ear-to-row (Nursery row numbers 158-14 through 158-15). Self-pollinated seed from row number 158-15 was saved and bulked.

Statement of Stability and Uniformity

Corn inbred 3IIH6 was coded in 1988 and has been reproduced and judged stable for the past three years by self-pollination. Inbred 3IIH6 is uniform for all traits observed. 3IIH6 tassel glume color and anther color are yellow as the tassel emerges. Exposure to light turns the glumes purple and anthers red. Tassel and anther color are stable and predictable color changes occur during development of the plant.

Statement of Variants

3IIH6 shows no variants other than what would normally be expected due to environment or that would occur for almost any character during the course of repeated sexual reproduction.

Novelty Statement 311H6

3IIH6 most closely resembles MBS847, an inbred available from Mike Brayton Seeds.

3IIH6 differs from MBS847 for a number of numeric traits. 3IIH6 was grown in a randomized complete block design, at one or more locations, along with MBS847 and a number of other inbreds in 1990 and 1991. For purposes of this analysis, the orthogonal contrast between 3IIH6 and MBS847 was broken out and analyzed.

If preliminary analysis indicated non-normality of residuals, a non-parametric analysis was performed. Specifically, an overall ranking of the data was performed, ranking observations across replications and across years. Then the usual normal theory F-statistic was applied to the ranks.

If the trait was found to be normally distributed, a parametric analysis was run on entry means across location or years.

For each trait analyzed: year or location, inbred, and year or location x inbred effects, were examined. Contrasts between 3IIH6 and MBS847 were calculated for each trait. The denominator for contrasts was the year or location x inbred interaction, since year or location is considered a random factor (as opposed to fixed).

The interaction between year or location and inbred was examined first. If the interaction was significant at the 5% level, then separate analyses were performed for each year or location. A significant interaction of year or location and inbred suggests that results for 3IIH6 may vary by year or location. If the year or location x inbred interaction was not significant, then the contrast between 3IIH6 and MBS847 was examined. If this contrast was significant at the 5% level, then the contrast is reported from the combined years data set.

Contrasts for a single year or location were calculated between 3IIH6 and MBS847 using a 5% level of significance. It was required that contrasts be significant for each of the years or locations at the 5% level (and that the direction of the difference be consistent across years or locations) for a trait to be considered significant. Therefore, any of the traits reported for 3IIH6 passed one of two stringent criteria; a) either the contrast was significant at the 5% level in an across-years or locations analysis, or b) the contrast was significant at the 5% level for each of the years or locations tested on an individual basis. There were four traits for which 3IIH6 was significantly different from MBS847: Plant Height, Ear Diameter, Ear Weight, and Kernel Weight/1,000K. The information on these traits is summarized and presented in Table 1.

5MS

Table 1

TRAIT	INBRI 3IIH6	ED MEAN MBS847		O OF OCATION YEARS	•	PROB LEVEL**
Plant Height (cm)*	204 1	105 7	10.4		10 55	
1990 1991	204.1 191.9	150.5	18.4 41.4		18.55 3.97	.000 .050
Ear Diameter (¢m)* 1990 1991	39.3 39.9		1.9 7.4		5.79 3.75	
Ear Weight (g)* 1990 1991	104.7 117.6	79.3 76.9	25.4 40.7		16.05 4.22	.000
Kernel Weight/ 1,000K (gm)* 1990 1991	282.5 240.0	228.0 210.0	54.5 30.0		28.84 6.14	.000 .016

^{*} Statistics calculated on the ranks

TRAIT DEFINITIONS:

<u>Plant Height</u> - Measured from soil to the top of the tassel in centimeters.

Ear Diameter - Diameter of the ear at the midpoint measured in centimeters.

Ear Weight - Weight of the ear expressed in grams.

<u>Kernel Weight/1,000K</u> - Weight of 1,000 kernels expressed in grams.

^{** .05, .01,} and .001 are significant at the 5, 1, and .1% levels, respectively.

FORM GR-470-28 (2-16-74)

The state of the state of

UNITED STATES DEPARTMENT OF ACRICULTURE AGRICULTURAL MARKETING SERVICE COMMODITIES SCIENTIFIC SUPPORT DIVISION BELTSVILLE, MARYLAND 20705 OBJECTIVE DESCRIPTION OF VARIETY

EXHIBIT C

CORN (ZEA MAYS)

NAME OF APPLICANTIS	
DEKALB Plant Genetics	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)	9300087
3100 Sycamore Road	VANIETY WAUE ON YEUBONANY
DeKalb, IL 60115	31 IH6
•	311110
Place the appropriate number that describes the varietal charac Place a zero in first box (4-8-0 8 9 or 0 9) when number	
1. TYPE:	
2 1-SWEET 2-DENT 3-FLINT	4-FLOUR 5-POP 6-ORNAMENTAL
2. REGION WHERE BEST ADAPTED IN THE U.S.A.:	
1 - NORTHWEST 2 - NORTHCENTRAL 5 - SOUTHCENTRAL 6 - SOUTHWEST	3 - NORTHEAST 4 = SOUTHEAST 7 = MOST REGIONS
1. MATURITY (In Region of Best Adeptebility):	(Under " omments" (pg. 3) state how
	heat units were calculated)
7 6 DAYS FROM EMERGENCE TO SON OF PLANTS IN SILK	1 4 2 7 HEAT UNITS
DAYS FROM SOX SILK TO OPTIMUM EDIBLE QUALITY	HEAT UNITS
5 6 DAYS FROM SOX SILK TO HARVEST AT 25% KERNEL M	OISTURE 1 3 1 6 HEAT UNITS
4. PLANT:	•
1 9 8 CM, HEIGHT (To tassel tip)	0 7 1 CM, EAR HEIGHT (To bese of top earl
112	
1 3 CM. LENGTH OF TOP EAR INTERNODE	
Number of Tillers:	Number of Ears Per Stalk:
	2 CHOISE STANDENCY
1 1-NONE 2-1-2 3-2-3 4->3	2 1 - SINGLE 2'-SLIGHT TWO-EAR TENDENCY 3 - STRONG TWO-EAR TENDENCY 4 - THREE-EAR TENDENCY
Cytoplasm Type:	
Oftopromi, () Pro	
1 1- NORMAL 2-"" 3-"" 4-	"C" 5 = OTHER (Specify)
5. LEAF (Field Corn Inbred Exemples Given):	
Color:	
2 1 - LIGHT GREEN (HY) 2 - MEDIUM GREEN (WF9) 3- DARK GREEN (814) 4- VERY DARK GREEN (K166
Angle from Stalk (Upper half):	heeth Pubscence:
Cidia non amy fabban namis	
2 1-<30. 2-30-60. 3->60.	2 1 - LIGHT (W22) 2 - MEDIUM (WF9)
	3 - HEAVY (OH26)
Marginal Weves:	ongitudinal Creases:
2 1 - NONE (HY) 2 - FEW (WF9) 3 - MANY (OH7L)	2 1 - ABSENT (OH51) 2 - FEW (OH56A)
C.	3 - MANY (PA11)
Width:	ength:
0 8 CM. WIDEST POINT OF EAR NODE LEAF	0 7 3 CM EAR NODE LEAF
1 Q NUMBER OF LEAVES PER MATURE PLANT	
I I I I I NUMBER OF LEAVESTER MATORETORY	

	Pert for 1
NUMBER OF LATERAL BRANCHES	•
Branch Angle-from Central Spike: Penduncle Langth:	***
2 1-< 30-40" 3->45" 08 CW FROM TOP LEAF TO BAS	SAL BRANCHES
2 1 - LIGHT (WF9) 2 - MEDIUM 3 - HEAVY(KY21)	
Anther Color: 3 - YELLOW 2 - PINK 3 - RED 4 - PURPLE Glume Color: 6 - OTHER (Specify) Green-Yellow	S - GREEN
Pollen Restoration for Cytoplasms (o = Not Tested, 1 = Partial, 2 = Good)	
"T" OTHER (Specify Cytoplasm and degrees of restoration)	
7. EAR (Husked Ear Data Except When Stated Otherwise):	1
1 6 CM LENGTH 4 0 MM, MID-POINT 1 1 1 GM, WEIGHT	
Kernel Rows:	
2 1 - INDISTINCT 2 - DISTINCT 15 NUMBER	
2 1 - STRAIGHT 2 - SLIGHTLY CURVED 3 - SPIRAL	
Silk Color (Exposed at Silking Stage):	
4 1 - GREEN 2 - PINK 3 - SALMON . 4 - RED	e went
Husk Color:	
1 - LIGHT GREEN 2 - DARK GREEN 3 - PINK	•
6 DRY A-RED S-PURPLE 6-BUFF	
Husk Extention: (Hervest Stage) Husk Leaf: 1 = SHORT (Earl Exposed) 2 = MEDIUM (Barely Covering Ear) 1 = SHORT (UM (8—15 CM)
2 3 - LONG (5-10CM Beyond Ear Tip) 4 - VERY LONG (> 10 CM)	
Shank: Position at Dry Husk Stage:	
0 9 CM LONG 6 NO. OF INTERNODES 1 1 - UPRIGHT 2 - HORIZONTA	L 3-PENDEN
Taper: Drying Time (Unhusked Ear):	•
2 1-SLIGHT 2-AVERAGE 3-EXTREME 2 1-SLOW 2-AVERAGE	3 - FAST
8. KERNEL (Dried): Size (From Ear Mid-Point): RECEIVED	
1 0 MM LONG 0 8 MM. WIDE 0 4 MM. THICK ST USDA AMS	03 > 7
Shape Grade (X Rounds)	27

8. KERNEL	(Oried) :				7		•
1	Fericerp Color:	1 - COLORLESS 5 - BROWN	2 - 6 -	RED-WHIT LIGHT RE	r € D	3 - TAN 7 - CHER	4 = BRONZE RY RED
·		8 - VARIEGATE	O (Describe) _				
1	Aleurone Color.	1 - HOMOZYGO	us :	? • SEGRE	GATING (Describe)	 	·
LL.	I = WHITE I = PURPLE	2 = PINK B = PALE PUF			4 = BROWN GATED (Describe)		6 - BRONZE 6 - REG
3 6	ndosperm Color:	1 - WHITE	2 - PALE YE	LLOW	J • YELLOW	4 = PINK	GORANGE S - WHITE CAP.
Endosperm	Type:						
131	- SWEET (101) - WAXY STARCI				3 - NORMAL STAI 7 - HIGH LYSINE		4 - HIGH AMYLOSE STARCH 8 - OTHER (Specify)
2 6	IM, WEIGHT /100	SEEDS (Unsited S	emple)				
9. COB:					· · · · · · · · · · · · · · · · · · ·		
2 1 ~	IM. DIAMETER A	T MID-POINT					
Strength:				Color	:		
2	- WEAK	2 = STRONG	•	3	1 - WHITE 2 - 5 - VARIEGATED		S OTHER (Specify)
10. DISEASE R	ESISTANCE (O -	Not Tested, 1 = Su	sceptible, 2 = Re	sistantl:			
0 s	TALK ROT (Diplo	die)	=	ROT (Fu _p a	rium)	0	STALK ROT (Gibberelle)
2 N	ORTHERN LEAF	BLIGHT	2 south	ERN LEAF	BLIGHT	0	SMUT
0 so	DUTHERN RUST		0 CORNS	MUT			BACTERIAL WILT
띨	ACTERIAL LEAF		0 MAIZE	DWARF M	DSAIC	0	STUNT
2 °	THER (Specify)	Anthracnose					
11. INSECT RE	SISTANCT (O = N	ot Tested, 1 = Susc	eptible, 2 = Resis	tent):			
	ORNBORER	. O E	LRWORM		0 SAPE	EETLE	O APHID
LI RO	ANON) MROWTOC	ern) [] RC	OOTWORM (West	tern)			
0 AC	OTWORM (South	ern) 01	HER (Specify)_				
12. VARIETIES	MOST CLOSELY	RESEMBLING TH	AT SUBMITTED	FOR THE	CHARACTERS GIV	EN:	
CHARACTE	R		VARIETY		CHARACTER		VARIETY
Meturity					Karnel Type		
Flant Type					Quelity (Edible)		
Cor	. Department Agri n: Culture, Froces	sing, Products. 19	70 Avi Publishing		Usage Westport; Connectic Studies in Malza,Coi		
	Mutants of Maire.						•
	ngfield, G.H. Male						
But	ler, D.A. 1954 - /	System for the C	lessification of Co	orn Inbred	Lines - PhD, Thesis,	Ohio State	University.
COMMENTS:	Heat U	nit Calcula	tions:	= 1 + D=	ilv Min Temr	(>50°	F) 500c

ADDITIONAL DESCRIPTION OF THE VARIETY

TRAIT	YEAR	311H6	MBS847	NO. PLANTS SAMPLED PER REP	NO. REPS	TOTAL NO. OBS PER MEAN	DIFF.	STD. DEV.++	95% Cl+++
Plant Height (cm)	1990	204.1	185.7	10	2	20	18.4	4.4	(9.7,27.1)
	1991	191.9	150.5	10	2	20	41,4	22.2	(-3.1,85.9)
Ear Diameter (¢m)	1990	39.3	37.4	5	2	10	1,9	0.1	(1.7,2.1)
,	1991	39.9	32.5	5	2	10	7.4	0.4	(6.6,8.2)
Ear Weight (g)	1990	104.7	79.3	10	2	20	25.4	7.9	(9.6,41.2)
	1991	117.6	76.9	10	2	20	40.7	22.6	(-4.6,86.0)
Kernel Weight/1,000K (g)	1990	282.5	228.0	+	2	2	54.5	12.1	(30.4,78.6)
	1991	240.0	210.0	+	2	2	30.0	24.9	(-19.7,79.7)

+Blank values under Number Plants Sampled Per Replicate indicate that 1 observation was recorded for each replication. No sampling within replication was done.

++The standard deviation of the difference in the means,

$$\sqrt{\frac{{s_1^2}}{n_1} + \frac{{s_2^2}}{n_2}}$$

where ${\bf s_i}^2$ = estimate of the variance of population 1 ${\bf n_i}_1$ = number of observations from population 1 ${\bf s_i}^2$ = estimate of the variance of population 2 ${\bf n_2}$ = number of observations from population 2

+++The 95% confidence interval for the difference in the two means is calculated

$$(\bar{x}_1 - \bar{x}_2) \pm t_{\frac{\alpha}{2}}, d\ell \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

where x_1 = estimate of the mean from population 1 x_2 = estimate of the mean from population 2 $t_{\alpha/2}$, df = is the upper $\alpha/2$ percentile of a t-distribution with degrees of freedom (df) based on the number of observations where α = 1 - confidence coefficient.

311H6.WQ1

ISOZYME ALLELES

Locus	3IIH6*	R177**
Acph-1	2	4
Cat-3	9	9
Got-1	4	4
Got-2	4	4
Got-3	4	4
ldh-1	4	4
ldh-2	6	6
Mdh-1	6	6
Mdh-2	3.5	6
Mdh-3	16	16
Mdh-4	12	12
Mdh-5	12	12
Pgm-1	9	9
Pgm-2	4	4
6-Pgd-1	3.8	3.8
6-Pgd-2	5	5
Phi-1	4	4

3IIH6 and R177 differ at the Acph-1 and Mdh-2 alleles.

^{*} Information is from DEKALB Isozyme Lab.

^{**} Information is from Allozyme Genotypes and Historically Important Inbred Lines of Corn, Zea Mays, L., USDA/ARS of August 1983.

EXHIBIT E

Statement of the Basis of Applicant's Ownership

DEKALB Plant Genetics is the sole, original, and first breeder of corn inbred 3IIH6.