No. 8700087

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Holden's Foundation Seeds, 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 ETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'LH60'

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* 31st *day of* July *in the year of our Lord one thousand nine hundred and* eighty-seven.

Attest:

Kenneth A. Evans

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Richard E. Lyng

Secretary of Agriculture

APPROVAL EXPIRES 2-28-88

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

FORM APPROVED: OMB NO. 0581-0055

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) Holden's Foundation Seeds, Inc.	2. TEMPORARY DESIGNATION Ex1098	3. VARIETY NAME LH60
4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)* R.R.#2, Box 839 Williamsburg, IA 52361	5. PHONE *(Include area code)* 319-668-1100	FOR OFFICIAL USE ONLY PVPO NUMBER 8700087
6. GENUS AND SPECIES NAME Zea mays	7. FAMILY NAME *(Botanical)* Gramieae	FILING DATE March 19, 1987 TIME 2:00 ☐ A.M. ☑ P.M.
8. KIND NAME Corn, Field	9. DATE OF DETERMINATION November 1985	FEES RECEIVED AMOUNT FOR FILING $ 1800.00 DATE March 19, 1987
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)* Corporation		AMOUNT FOR CERTIFICATE $ 200.00 DATE June 29 1987
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Iowa		12. DATE OF INCORPORATION

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

Mr. Mark Armstrong
P.O. Box 839
Williamsburg, IA 52361 PHONE *(Include area code)*: 319-668-1100

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
d. ☒ Exhibit D, Additional Description of Variety.
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

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.)* ☐ Yes *(If "Yes," answer items 16 and 17 below)* ☒ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? ☐ Yes ☒ No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? ☐ Foundation ☐ Registered ☐ Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? ☐ Yes *(If "Yes," give date)* ☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES ? ☐ Yes *(If "Yes," give names of countries and dates)* ☒ 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 believe(s) 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 [signature]	DATE 3/12/87
SIGNATURE OF APPLICANT	DATE

FORM LS-470 (3-86) *Edition of 7-84 obsolete.*

Exhibit A

'LH60' was developed through a pedigreed system of breeding. On the following page is a schematic description of the development of 'LH60'. Also included are copies of pages from Holden's Foundation Seeds nursery book. The rows associated with the development of 'LH60' have been highlighted.

Attached is a statement from the originating plant breeder, Terry Foley, Holden's Foundation Seeds, stating that the line is uniform, stable and free of variance from within the population.

Exhibit A

8700087

Origin and Breeding History of the Inbred

LH60 Ex1098 LH55 x LH47

Row	Pedigree	Location	Year
W. Homestead Field	LH60	Iowa	1986
Newhart	LH60	Hawaii	1985-86
6314-6323	Ex1098	Iowa	1985
9354	LH55 x LH47⊠^{7}	Iowa	1984
2493	LH55 x LH47⊠^{6}	Hawaii	1983-84
3607	LH55 x LH47⊠^{5}	Iowa	1983
4624	LH55 x LH47⊠^{4}	Hawaii	1982-83
2157	LH55 x LH47⊠^{3}	Iowa	1982
20711	LH55 x LH47⊠^{2}	Iowa	1981
1-545	LH55 x LH47⊠^{1}	Hawaii	1981

Exhibit A

Uniformity Statement

I have observed 'LH60' during the three generations it has been increased, 1985 Iowa nursery rows 6314-6323, 1986 Newhart field Hawaii, 1986 West Homestead field Iowa. In each of the increases the seeds from the previous generation were planted. The line is very stable, uniform and free of variance from generation to generation.

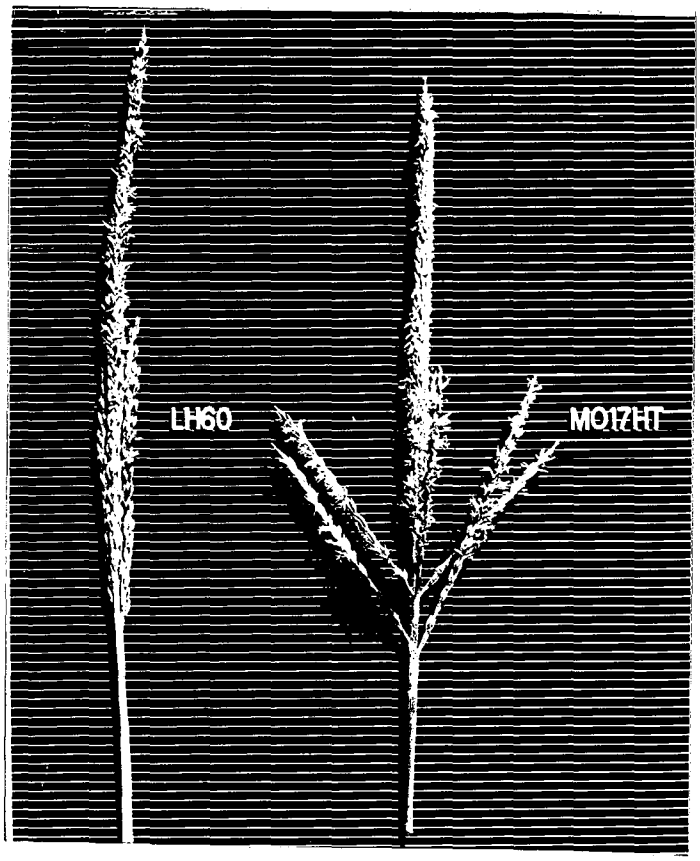
Terry Foley

Terry Foley
Plant Breeder

Exhibit B

The Novelty Statement

'LH60' most closely resembels 'Mo17Ht'; however, the most distinguishing charactoristic is the tassel. 'LH60' has a tassel branch angle of less than 30° as the tassel branches are almost parallel with the center spike. 'Mo17Ht' has a more open tassel branch angle of 30°-40°. This difference can be seen in the picture below.



The tassel of 'LH60' (on the left) has very upright tassel branches. They are almost indistinguishable from the center spike. The tassel of 'Mo17Ht', (on the right) however, has a much more open tassel because of the wider tassel branch angle.

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-28
(2-15-74)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C
(Corn)

OBJECTIVE DESCRIPTION OF VARIETY

CORN *(ZEA MAYS)*

6419-6425

NAME OF APPLICANT(S)
Holden's Foundation Seeds, Inc.

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
R.R.#2, P.O. Box 839
Williamsburg, IA 52361

FOR OFFICIAL USE ONLY

PVPO NUMBER
8700087

VARIETY NAME OR TEMPORARY DESIGNATION
LH60

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

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.:

[7] 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST
5 = SOUTHCENTRAL 6 = SOUTHWEST 7 = MOST REGIONS

3. MATURITY (In Region of Best Adaptability):

(Under "comments" (pg. 3) state how heat units were calculated)

[8][3] DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK [1][6][3][9] HEAT UNITS

[ ][ ] DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY [ ][ ][ ][ ] HEAT UNITS

[ ][ ] DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE [ ][ ][ ][ ] HEAT UNITS

4. PLANT:

[2][2][4] CM. HEIGHT (To tassel tip) [0][7][8] CM. EAR HEIGHT (To base of top ear)

[1][8] CM. LENGTH OF TOP EAR INTERNODE

Number of Tillers:

[1] 1 = NONE 2 = 1–2 3 = 2–3 4 = > 3

Number of Ears Per Stalk:

[1] 1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY
3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

Cytoplasm Type:

[1] 1 = NORMAL 2 = "T" 3 = "S" 4 = "C" 5 = OTHER (Specify) _____

5. LEAF (Field Corn Inbred Examples Given):

Color: 5Gy4/6 Munsell Color Charts for Plant Tissues

[ ] 1 = LIGHT GREEN (HY) 2 = MEDIUM GREEN (WF9) 3 = DARK GREEN (B14) 4 = VERY DARK GREEN (K166)

Angle from Stalk (Upper half):

[1] 1 = < 30° 2 = 30–60° 3 = > 60°

Sheath Pubscence:

[2] 1 = LIGHT (W22) 2 = MEDIUM (WF9)
3 = HEAVY (OH26)

Marginal Waves:

[2] 1 = NONE (HY) 2 = FEW (WF9) 3 = MANY (OH7L)

Longitudinal Creases:

[2] 1 = ABSENT (OH51) 2 = FEW (OH56A)
3 = MANY (PA11)

Width:

[1][0] CM. WIDEST POINT OF EAR NODE LEAF

Length:

[0][7][2] CM. EAR NODE LEAF

[1][1] NUMBER OF LEAVES PER MATURE PLANT

6. TASSEL:

[0 3] NUMBER OF LATERAL BRANCHES

Branch Angle from Central Spike:

[1] 1 = < 30° 2 = 30–40° 3 = > 45°

Penduncle Length:

[1 1] CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

[2] 1 = LIGHT (WF9) 2 = MEDIUM 3 = HEAVY(KY21)

[6] **Anther Color:** } 1 = YELLOW 2 = PINK 3 = RED 4 = PURPLE 5 = GREEN
[6] **Glume Color:** } 6 = OTHER (Specify) yellow & purple; 1/2 purple, 1/2 green

Pollen Restoration for Cytoplasms (o = Not Tested, 1 = Partial, 2 = Good)

[0] "T" [0] "S" [0] "C" [0] OTHER (Specify Cytoplasm and degrees of restoration) _____

7. EAR (Husked Ear Data Except When Stated Otherwise):

[1 7] CM LENGTH [3 9] MM. MID-POINT DIAMETER 1 [3 0] GM. WEIGHT

Kernel Rows:

[2] 1 = INDISTINCT 2 = DISTINCT [1 4] NUMBER

[1] 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = SPIRAL

Silk Color (Exposed at Silking Stage):

[2] 1 = GREEN 2 = PINK 3 = SALMON 4 = RED

Husk Color:

[1] FRESH } 1 = LIGHT GREEN 2 = DARK GREEN 3 = PINK
[6] DRY } 4 = RED 5 = PURPLE 6 = BUFF

Husk Extention: (Harvest Stage)

[2] 1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear)
3 = LONG (8–10CM Beyond Ear Tip)
4 = VERY LONG (> 10 CM)

Husk Leaf:

[1] 1 = SHORT (< 8 CM) 2 = MEDIUM (8–15 CM)
3 = LONG (> 15 CM)

Shank:

[0 6] CM LONG [6] NO. OF INTERNODES

Position at Dry Husk Stage:

[3] 1 = UPRIGHT 2 = HORIZONTAL 3 = PENDENT

Taper:

[1] 1 = SLIGHT 2 = AVERAGE 3 = EXTREME

Drying Time (Unhusked Ear):

[2] 1 = SLOW 2 = AVERAGE 3 = FAST

8. KERNEL (Dried):

Size (From Ear Mid-Point):

[1 1] MM LONG [0 9] MM. WIDE [0 4] MM. THICK

Shape Grade (% Rounds)

[3] 1 = < 20 2 = 20–40 3 = 40–60 4 = 60–80 5 = > 80

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8. KERNEL (Dried) :

[1] **Pericarp Color:** 1 = COLORLESS 2 = RED-WHITE CROWN 3 = TAN 4 = BRONZE 5 = BROWN 6 = LIGHT RED 7 = CHERRY RED 8 = VARIEGATED (Describe) _____

[1] **Aleurone Color:** 1 = HOMOZYGOUS 2 = SEGREGATING (Describe) _____

[1] 1 = WHITE 2 = PINK 3 = TAN 4 = BROWN 5 = BRONZE 6 = RED 7 = PURPLE 8 = PALE PURPLE 9 = VARIEGATED (Describe) _____

[3] **Endosperm Color:** 1 = WHITE 2 = PALE YELLOW 3 = YELLOW 4 = PINK-ORANGE 5 = WHITE CAP.

Endosperm Type:

[3] 1 = SWEET (su1) 2 = EXTRA SWEET (sh2) 3 = NORMAL STARCH 4 = HIGH AMYLOSE STARCH 5 = WAXY STARCH 6 = HIGH PROTEIN 7 = HIGH LYSINE 8 = OTHER (Specify) _____

[2 8] GM. WEIGHT /100 SEEDS (Unsized Sample)

9. COB:

[2 6] MM. DIAMETER AT MID-POINT

Strength:

[2] 1 = WEAK 2 = STRONG

Color:

[3] 1 = WHITE 2 = PINK 3 = RED 4 = BROWN 5 = VARIEGATED 6 OTHER (Specify) _____

10. DISEASE RESISTANCE (O = Not Tested, 1 = Susceptible, 2 = Resistant):

0	STALK ROT (Diplodia)	0	STALK ROT (Fusarium)	0	STALK ROT (Gibberella)
0	NORTHERN LEAF BLIGHT	0	SOUTHERN LEAF BLIGHT	0	SMUT
0	SOUTHERN RUST	0	CORN SMUT	0	BACTERIAL WILT
0	BACTERIAL LEAF BLIGHT	0	MAIZE DWARF MOSAIC	0	STUNT
0	OTHER (Specify)				

11. INSECT RESISTANCT (O = Not Tested, 1 = Susceptible, 2 = Resistant):

0	CORNBORER	0	EARWORM	0	SAPBEETLE	0	APHID
0	ROOTWORM (Northern)	0	ROOTWORM (Western)				
0	ROOTWORM (Southern)	0	OTHER (Specify) _____				

12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity	Mo17Ht	Kernel Type	Mo17Ht
Plant Type	Mo17Ht	Quality (Edible)	
Ear Type	Mo17Ht	Usage	Mo17Ht

REFERENCES:

U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous (Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize.Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 – A System for the Classification of Corn Inbred Lines – PhD. Thesis, Ohio State University.

COMMENTS:

$$GOD = \frac{Tmax + Tmin}{2} - 50^{o}F$$

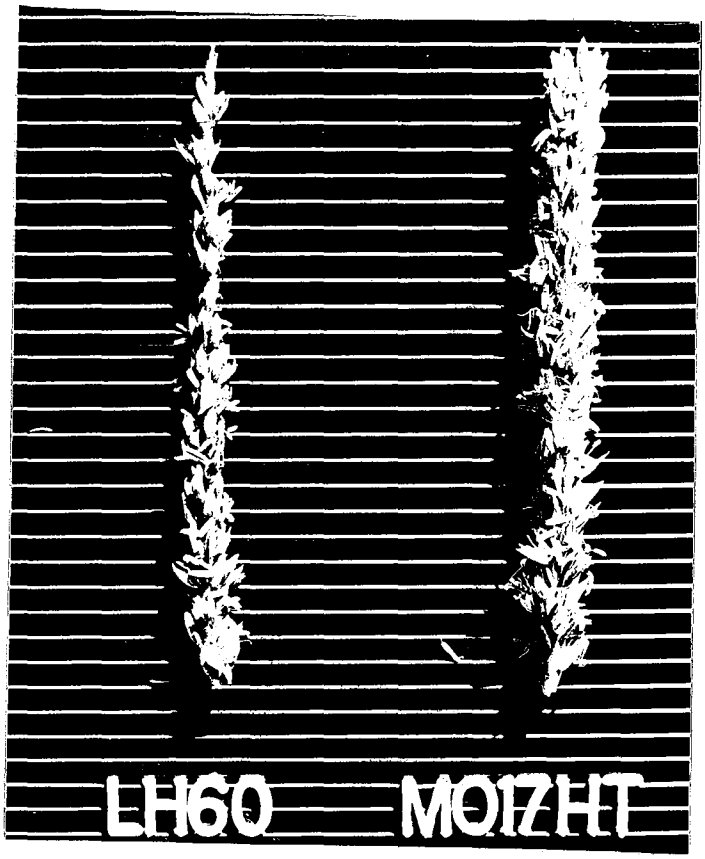
$Tmax \leq 86^{o}F$
$Tmin \geq 50^{o}F$

8

Exhibit D

Additional Description of Inbred

'LH60' has some other charactoristics that distinguish it from 'Mo17Ht'. There is a difference in glume and anther color. 'LH60' has a glume that is green and purple striped. 'Mo17Ht has a green glume. 'LH60' has a purple and yellow anther while 'Mo17Ht' has a yellow anther. These differences can be seen in the photograph below.

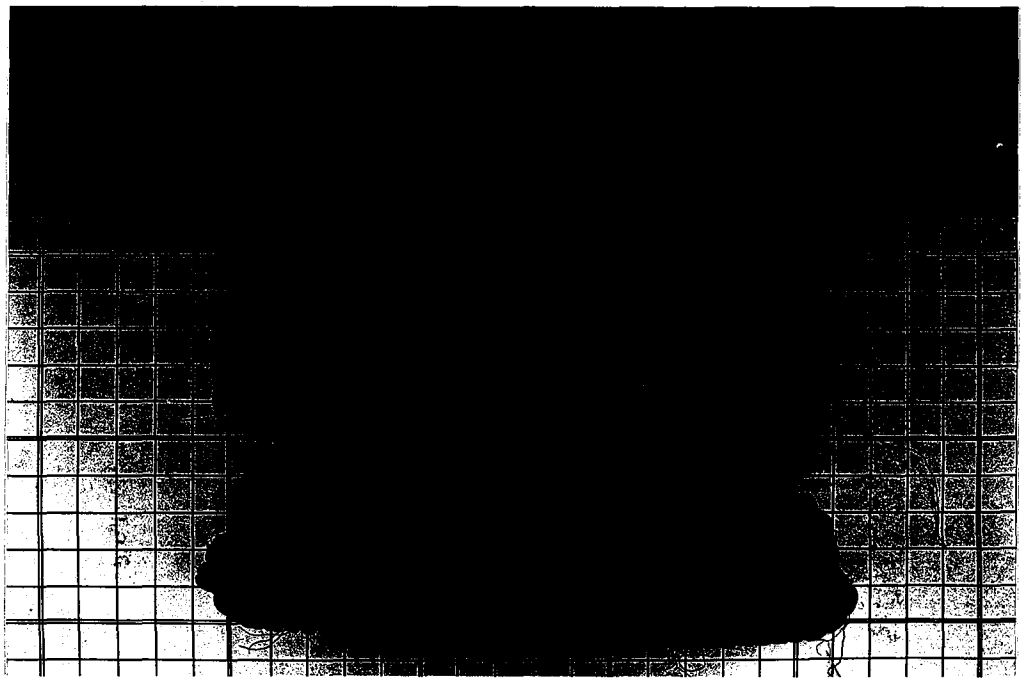


'LH60' has half as many lateral tassel branches as 'Mo17Ht'. 'LH60' averages 3 lateral tassel branches and 'Mo17Ht' averages 7 lateral tassel branches.

Exhibit D cont.

The silk color of 'LH60' is pink whereas the silk color of 'Mo17' is salmon. Both inbred lines are medium to dark green in color. When using the Munsell Color Charts for Plant Tissues as a reference both inbred lines would be classified a 5GY4/6. 'LH60' is slightly taller than 'Mo17Ht' (224cm Vs. 216 cm).

Both 'LH60' and 'Mo17Ht' are the same maturity, however 'LH60' reaches mid-silk within 1-2 days after mid-pollen. 'Mo17Ht' reaches mid-silk 5-7 days after mid-pollen.



LH60 Ear Sample

Exhibit E

Statement of the Basis of Applicants Ownership

Holden's Foundation Seeds, Inc. Iowa, believes it is the sole owner and breeder of the 'LH60' field corn inbred for which it solicits a certificate of protection.