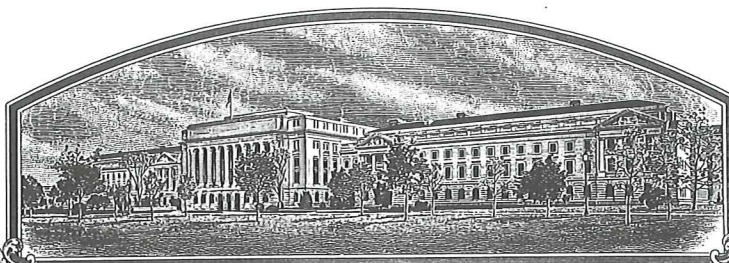


No.

201100433



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME;

Syngenta Crop Protection AG

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 purposes, 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.)

CORN, FIELD

'NPHD1001'



Attest:

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 nineteenth day of December, in the year two thousand and thirteen.*

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

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

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).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
 (Instructions and information collection burden statement on reverse)

| | | | | | |
|---|--|--|-----------------------------|---|--|
| 1. NAME OF OWNER Syngenta Crop Protection A.G. AG | | 2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME | | 3. VARIETY NAME NPHD1001 | |
| 4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Schwarzwaldelle 215 Basel Switzerland 4058 | | 5. TELEPHONE (include area code) +41 61 323 11 11 | | FOR OFFICIAL USE ONLY PVPO NUMBER PV# 201100433 FILING DATE July 20, 2011 | |
| | | 6. FAX (include area code) +41 61 323 12 12 | | | |
| 7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corporation | | 8. IF INCORPORATED, GIVE STATE OF INCORPORATION Switzerland DE | | 9. DATE OF INCORPORATION 09/24/1976 Dec. 3, 1996 | |
| 10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Dana Rewoldt Leah Houg Dwight Bostwick Roxanne Mainz Syngenta Seeds Inc. 2369 330th ST Slater IA 50124 | | | | FILING AND EXAMINATION FEES: \$ 4382.00 DATE 7/20/2011 CERTIFICATION FEE: \$ DATE | |
| 11. TELEPHONE (Include area code) 515.685.5000 | | 12. FAX (include area code) 515.685.5072 | | 13. E-MAIL roxanne.mainz@syngenta.com dana.rewoldt@syngenta.com | |
| 14. CROP KIND (Common Name) Corn, field | | 16. FAMILY NAME (Botanical) gramineae | | 18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | |
| 15. GENUS AND SPECIES NAME OF CROP Zea mays L. | | 17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION. | |
| 19. 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. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Exhibit F. Declaration Regarding Deposit g. <input type="checkbox"/> Voucher Sample (3,000 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) h. <input checked="" type="checkbox"/> Filing and Examination Fee (\$4,382), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office) | | | | 20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input type="radio"/> YES (if "yes", answer items 21 and 22 below) <input checked="" type="radio"/> NO (if "no", go to item 23) <input type="radio"/> UNDECIDED | |
| | | | | 21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED | |
| | | | | 22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.) | |
| 23. 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? <input checked="" type="checkbox"/> YES <input type="checkbox"/> 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.) | | | | 24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.) | |
| 25. The owners declare that a viable sample of basic seed of the variety has been 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 result in penalties. | | | | | |
| SIGNATURE OF OWNER | | | SIGNATURE OF OWNER | | |
| NAME (Please print or type) Dwight Bostwick | | | NAME (Please print or type) | | |
| CAPACITY OR TITLE Head, NAFTA Corn Breeding Projects | | DATE 7-19-11 | | CAPACITY OR TITLE | |
| | | | | DATE | |

03/21/2012 dbc
09/20/2013 dbc

GENERAL INSTRUCTIONS: 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, F; (3) for a tuber reproduced variety, verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; and (4) payment by credit card or check drawn on a U.S. bank for \$4,382 (\$518 filing fee and \$3,864 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice). **NEW:** With the application for a seed reproduced variety or by direct deposit soon after filing, the applicant must provide at least 3,000 viable untreated seeds of the variety *per se*, and for a hybrid variety at least 3,000 untreated seeds of each line necessary to reproduce the variety. Partial applications will be held in the PVPO for not more than 90 days; then returned to the applicant as un-filed. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, 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 initiated and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a payment by credit card or check payable to "Treasurer of the United States" in the amount of \$768 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

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. The fees for filing a change of address; owner's representative; 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 the Regulations and Rules of Practice.)

Plant Variety Protection Office
Telephone: (301) 504-5518 **FAX:** (301) 504-5291
General E-mail: PVPOmail@usda.gov
Homepage: <http://www.ams.usda.gov/science/pvpo/PVPindex.htm>

SPECIFIC INSTRUCTIONS:

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that the permanent name of the application variety (even if it is a parental, inbred line) has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Programs, **Seed Regulatory and Testing Branch**, 801 Summit Crossing Place, Suite C, Gastonia, North Carolina 28054-2193 Telephone: (704) 810-8870. <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. 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
- 19b. 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 replicated statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. 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 color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. 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, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. 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.)

US 07-26-2010

24. 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).)

US Utility Application 12932391 filed 02-24-2011

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not 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 complete this information collection is estimated to average 1.4 hours 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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (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 USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Syngenta
NPHD1001
Exhibit A

Origin and Breeding History of Corn Inbred Line NPHD1001

The corn inbred line NPHD1001 was developed from an uncoded inbred line and inbred line T37-80. The uncoded inbred line was developed from a three way cross of inbred line NPHI4061 by inbred line ZS01101 (PVP certificate 9600268 and US Patent 5,723,725) then crossed to inbred line ZS01452 (US Patent 5,723,726). NPHI4061 was developed from inbred line LH82 (PVP certificate 8500037) and Pioneer Brand F1 hybrid 3779. ZS01452 was developed from inbred line LH85 (PVP certificate 8700088) and Pioneer Brand F1 hybrid 3733. T37-80 was licensed from Hyland Seeds, a division of W.G. Thompson & Sons Limited via a joint venture with Zeneca Seeds (Garst Seed Co. which was a part of Zeneca Seeds is now part of Syngenta, Seeds). T37-80 was derived from the F1 hybrid Pioneer Brand 3737. LH82 and LH85 are from Holden's foundation Seeds, Inc. NPHD1001, NPHI4061, ZS01101, ZS01452 are proprietary lines from Syngenta Seeds, Inc.

After the initial cross in the summer of 1999, mass selection and pedigree selection were employed for the development of inbred line NPHD1001.

The chronology of inbreeding is given below:

| | |
|-------------------------------|--|
| Summer 1999 Blenheim, Ontario | Initial cross made to create F1 population |
| Summer 2000 Blenheim, Ontario | F1 population self pollinated to produce F2 population |
| Summer 2001 Blenheim, Ontario | F2 population self pollinated to produce F3 population |
| Summer 2002 Blenheim, Ontario | F3 population self pollinated to produce F4 families |
| Summer 2003 Blenheim, Ontario | F4 families self pollinated to produce F5 families |
| Summer 2004 Blenheim, Ontario | F5 families self pollinated to produce F6 families |
| Summer 2005 London, Ontario | F6 families self pollinated to produce F7 families |
| Winter 2005 Graneros, Chile | F7 families self pollinated to produce F8 lines |
| Summer 2006 Arva, Ontario | F8 lines self pollinated to produce F9 lines |
| Summer 2007 Arva, Ontario | F9 lines self pollinated to produce F10 lines |
| Winter 2007 Kunia, Oahu, HI | Line self pollinated and ears bulked to produce Breeder's Seed for inbred line NPHD1001. |

Selection criteria used during the inbreeding process included synchronous male and female flowering, plant health, ear fill, pre-harvest intactness and resistance to various stalk rots. Plants within each generation were also closely evaluated for uniformity of anther and silk color and plant and ear height. Selection was also done for general and specific combining ability for yield in hybrid combinations across several inbreds.

From 2008 to the present, the inbred line has been observed in Arva, Canada, Slater, IA and other locations. No phenotypic or isozymic variants have been observed. NPHD1001 has been a uniform and stable inbred for at least 5 generations.

Exhibit B
 Syngenta
 NPHD1001

Statement of Distinctness

The corn inbred line NPHD1001 is most similar to Elite Syngenta Inbred line NP2536, PVP certificate 200600095 and US Patent 7,534,942. Comparisons of the inbred lines were conducted at the Stanton, MN Syngenta Seeds, Inc station and at a location near River Falls, WI in 2010.

Inbred line NPHD1001 differs from Elite Syngenta inbred line NP2536 at Loci MDH2, MDH3 and ACP1. This is shown in Table 1 below. Inbred line NPHD1001 also differs from Elite Syngenta inbred line NP2536 in Length of Ear Node leaf at the top node at which the ear arises, Width of Ear Node leaf at the top node at which the ear arises, and Central Tassel Spike (from top tassel branch to tassel tip). See Table 2 below.

NPHD1001 is a distinct and unique line.

Table 1. Isozyme Profile of Inbred Line NPHD1001 and Syngenta elite inbred line NP2536.

| LOCI | NPHD1001 | NP2536 |
|------------|----------|--------|
| Locus PGM1 | 9 | 9 |
| Locus PGM2 | 4 | 4 |
| Locus PGD1 | 3.8 | 3.8 |
| Locus PGD2 | 5 | 5 |
| Locus IDH1 | 4 | 4 |
| Locus IDH2 | 6 | 6 |
| Locus MDH1 | 6 | 6 |
| Locus MDH2 | 3 | 6 |
| Locus MDH3 | 16 | 18 |
| Locus MDH4 | 12 | 12 |
| Locus MDH5 | 12 | 12 |
| Locus MDH6 | Mmm | Mmm |
| Locus ACP1 | 4 | 2 |
| Locus ACP4 | 4 | 4 |
| Locus PHI1 | 4 | 4 |
| Locus ADH1 | 4 | 4 |

Exhibit B

Syngenta ~~Seeds, Inc~~ Crop Protection AG
 NPHD1001 cont.

03/21/2012 dbc

Table 2. Summary of differences in Length of Ear Node leaf at the top node at which the ear arises, Width of Ear Node leaf at the top node at which the ear arises, and Central Tassel Spike (from top tassel branch to tassel tip) between inbred lines NPHD1001 and NP2536. T test done using two sample test at 95% confidence interval; using S-PLUS® 6.2 for Windows STANDARD EDITION.

| Trait | Location/ Planting date | Inbred Line A | Inbred Line B | Count A | Count B | Mean A | Mean B | Mean diff. | Std Dev A | Std Dev B | P value | T test |
|--|-------------------------------|------------------|------------------|------------|------------|-------------------------|-----------|---------------|-----------------------|-----------------|------------|----------|
| Length of Top Ear Node Leaf (cm) | Stanton, MN 5/17/2010 | NPHD1001 | NP2536 | 30 | 30 | 72.1 | 83.2 | -11.1 | 4.1 | 3.5 | 0 | -10.704 |
| Length of Top Ear Node Leaf (cm) | River Falls, WI 5/4/2010 | NPHD1001 | NP2536 | 15 | 15 | 70.5 | 78.4 | -7.9 | 1.9 | 1.8 | 0 | -11.087 |
| Width of Top Ear Node Leaf (cm) | Stanton, MN 5/17/2010 | NPHD1001 | NP2536 | 30 | 30 | 9.8 | 7.9 | 1.9 | 0.7 | 0.6 | 0 | 11.086 |
| Width of Top Ear Node Leaf (cm) | River Falls, WI 5/4/2010 | NPHD1001 | NP2536 | 15 | 15 | 9.9 | 7.7 | 2.2 | 0.5 | 0.5 | 0 | 11.599 |
| Tassel Central Spike length(cm) | Stanton, MN 5/17/2010 | NPHD1001 | NP2536 | 25 | 25 | 14.5 14.4 | 23.8 | -9.4 | 1.9 1.6 | 2.1 | 0 | -16.2954 |
| Tassel Central Spike length(cm) | River Falls, WI 5/4/2010 | NPHD1001 | NP2536 | 15 | 15 | 15.4 | 26.4 | -11 | 1.2 | 1.8 | 0 | -17.9863 |

dbc 11/12/2013

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not 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 complete this information collection is estimated to average 3.5 hours 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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, family status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audio tape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-4170, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

**U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705**

Exhibit C

**OBJECTIVE DESCRIPTION OF VARIETY
Corn (*Zea mays* L.)**

| | | |
|--|--|---|
| NAME OF APPLICANT (s) Syngenta Crop Protection AG | TEMPORARY OR EXPERIMENTAL DESIGNATION | VARIETY NAME NPHD1001 |
| ADDRESS (Street and R.D. No., City, State, Zip Code, and Country) Schwarzwaldelle 215 Basel Switzerland 4058 | | POP OFFICIAL USE ONLY P/PO NUMBER PV# 201100433 |

In the spaces on the left, enter the appropriate numbers that describe the characteristics of the application variety. On the right, enter the appropriate numbers that describe the characteristics of the most similar comparison variety. Right justify whole numbers by adding leading zeros if necessary. The variety that you choose for comparison should be the most similar one in terms of overall morphology, background, genetics, and maturity.

In general, for this form, measurements of quantitative traits should be taken in **one trial on 15-25 randomly selected plants** to obtain averages and statistics that describe a typical field of the variety. Trials should be done preferably in one location, with replicates, in the region of best adaptability (where the variety will grow and perform to its best potential). Trials should include the application variety plus all comparison varieties.

At least one year of trials should be conducted within the United States of America. (Form technical content last updated Dec. 2008.)

The following historical STANDARD INBRED LINES are available from the North Central Regional Plant Introduction Station in Ames, Iowa. They have been well characterized and may be used as comparison varieties. If used, then 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 | W182BN | 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 |

Describe the Region of Best Adaptability, trial set-up, and the environmental conditions (including monthly temperatures and rainfall) during the trial (continue in Comment Section).

Region of best adaptability- North Central region. Randomized complete Block Trial design. Trial at Stanton, MN Syngenta Seeds, Inc location, summer 2010.

Monthly Temp ave. High, Monthly Temp ave. Low, Monthly ave. rainfall- May: 80.5 F, 55.8 F, 2.3 in.; June: 75.9 F, 58.7 F, 5.2 in.; July: 82.1 F, 58.8 F, 4.6 in.; August: 83.1 F, 64.4 F, 5.5 in.; Sept: 68.3 F, 44.5 F, 9.4 in. This location was irrigated with approximately 1 in. one time in July and once in August.

| | |
|--|--|
| 1. TYPE: 0 5 1 = Flint 2 = Flint-like 3 = Intermediate 4 = Dent-like 5 = Dent | Comparison Variety Name: NP2536 0 5 Type |
| 2. MATURITY (In Region Best Adaptability, show Heat Unit Formula in Comments section) | |
| DAYS HEAT UNITS 065 1266.5 From planting to 50% of plants in silk | DAYS HEAT UNITS 064 1244.5 50% Silk |
| 064 1244.5 From planting to 50% of plants in pollen | 063 1223.0 50% Pollen |
| Application Variety Data | Comparison Variety Data |

| Application Variety Data | | | | Comparison Variety Data | | | |
|--------------------------|---|--------------------|-------------|-------------------------|--|--------------------|-------------|
| 3. PLANT: | | | | Mean | | | |
| | | Standard Deviation | Sample Size | | | Standard Deviation | Sample Size |
| 206.7 | cm Plant Height (to tassel tip) | 6.2 | 30 | 199.0 | cm Plant Height | 8.2 | 30 |
| 065.5 | cm Ear Height (to base of top ear node) | 8.0 | 30 | 057.5 | cm Ear Height | 5.4 | 30 |
| 015.3 | cm Length of Top Ear Internode | 1.0 | 30 | 016.8 | cm Internode | 1.0 | 25 |
| 3 | Anthocyanin of Brace Roots (when brace roots are green with some red or purple anthocyanin in stripes or speckles, rate the shade of anthocyanin) 1 = Absent (Green) 3 = Weak (Pink) 5 = Medium (Light red; Light red/purple) 7 = Strong (Red; Red/purple) 9 = Very Strong (Dark red/purple) | | | 3 | Brace Root Anthocyanin | | |
| 4. LEAF: | | | | Mean | | | |
| | | Standard Deviation | Sample Size | | | Standard Deviation | Sample Size |
| 009.8 | cm Width of Ear Node Leaf | 0.7 | 30 | 007.9 | cm Leaf Width | 0.6 | 30 |
| 072.1 | cm Length of Ear Node Leaf | 4.1 | 30 | 083.2 | cm Leaf Length | 3.5 | 30 |
| 1 | Leaf Attitude from main stem to tip of leaf (see UPOV diagrams) 1 = Erect 3 = Horizontal 5 = Drooping | | | 5 | Leaf Attitude | | |
| 1 | Pubescence on margin/edge of leaf sheath (Rate on scale from 1 = none to 9 = like peach fuzz) | | | 3 | Pubescence on margin/edge of leaf sheath | | |
| 5. TASSEL: | | | | Mean | | | |
| | | Standard Deviation | Sample Size | | | Standard Deviation | Sample Size |
| 14 | Number of Primary Lateral Branches | 1.2 | 25 | 05 | No. Tassel Branches | 1.1 | 25 |
| 33.7 | cm Tassel Length (From top node below flag leaf to tassel tip) | 2.9 | 25 | 33.1 | cm Tassel Length | 3.0 | 25 |
| 9.6 | cm Tassel Peduncle Length (From top node below flag leaf to bottom tassel branch) | 1.6 | 25 | 3.6 | cm Peduncle Length | 1.7 | 25 |
| 14.5 | cm Tassel Central Spike Length (From top tassel branch to tassel tip) | 1.9 | 25 | 23.8 | cm Central Spike Len | 2.1 | 25 |
| 1 | Branch Attitude from Central Spike from main spike to tip of tassel branch (see UPOV diagrams) 1 = Erect 3 = Horizontal 5 = Drooping | | | 1 | Tassel Branch Attitude | | |
| 1 | Anther Color (2-3 days after being exposed to allow for sun reddening effects) 1 = Green or Yellow (ex. Munsell Code 2.5GY 8/6 or 10Y 8.5/6) 3 = Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 5 = Red (ex. Munsell 2.5R 4/8) 7 = Dark Red (ex. Munsell 1.0RP 4/8) 9 = Purple (ex. Munsell 5RP 5/8) | | | 3 | Anther Color 5R5/2 | | |
| 2.5GY8/6 | | | | | | | |
| 1 & 9 | Glume Color (on the top 2/3 of the glume) 1 = Green or Yellow (ex. Munsell Code 2.5GY 8/6 or 10Y 8.5/6) 3 = Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 5 = Red (ex. Munsell 2.5R 4/8) 7 = Dark Red (ex. Munsell 1.0RP 4/8) 9 = Purple (ex. Munsell 5RP 5/8) | | | 1 & 9 | Glume Color 5GY5/6 & 5RP4/4 | | |
| 7.5GY5/6 & 5RP4/4 | | | | | | | |
| Absent | Bar Glume Anthocyanin Color (on the bottom 1/3 of glume; see UPOV Diagram; Note: the bar glume is listed as "present" if it is present and the ring is at least 50% closed) 1 = Green or Yellow (ex. Munsell Code 2.5GY 8/6 or 10Y 8.5/6) 3 = Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 5 = Red (ex. Munsell 2.5R 4/8) 7 = Dark Red (ex. Munsell 1.0RP 4/8) 9 = Purple (ex. Munsell 5RP 5/8) | | | Absent | Bar Glume Anthocyanin Color | | |

| Application Variety Data | | | | Comparison Variety Data | | | |
|---|--------------------|-------------|----------|---|-------------|---|--|
| 6a. EAR (Unhusked Data): | | | | Mean | | | |
| | Standard Deviation | Sample Size | | Standard Deviation | Sample Size | | |
| 5.9 | 0.9 | 30 | 8.6 | 1.2 | 30 | cm Husk Extension | |
| 19.8 | 1.5 | 20 | 20.5 | 1.6 | 30 | cm Husk Leaf Len | |
| 1 | | | 1 | | | Silk Color | |
| 2.5GY8/6 | | | 2.5GY8/8 | | | | |
| 1 = Green or Yellow (ex. Munsell Code 2.5GY 8/6 or 10Y 8.5/6) 3 = Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 5 = Red (ex. Munsell 2.5R 4/8) 7 = Dark Red (ex. Munsell 10RP 4.8) 9 = Purple (ex. Munsell 5RP 5/8) | | | | | | | |
| 6b. EAR (Husked Ear Data): | | | | Mean | | | |
| | Standard Deviation | Sample Size | | Standard Deviation | Sample Size | | |
| 11.8 | 0.9 | 30 | 10.8 | 0.7 | 30 | cm Ear Length | |
| 43.5 | 1.3 | 30 | 39.5 | 1.6 | 30 | mm Ear Diameter | |
| 113.6 | 11.6 | 30 | 073.4 | 12.6 | 30 | gm Ear Wt. | |
| 17 | 1.1 | 30 | 17 | 1.2 | 30 | No. Kernel Rows | |
| 23.1 | 1.1 | 15 | 18.9 | 1.2 | 15 | No. Kernels per Row | |
| 14.3 | 2.6 | 30 | 09.3 | 1.9 | 30 | cm Shank Length | |
| 7. KERNEL (Dried): | | | | Mean | | | |
| | Standard Deviation | Sample Size | | Standard Deviation | Sample Size | | |
| 11.0 | 0.4 | 15 | 10.4 | 0.5 | 15 | mm Kernel Length | |
| 07.0 | 0.3 | 15 | 07.8 | 0.4 | 15 | mm Kernel Width | |
| 2 | | | 2 | | | Hard Endosperm Color | |
| 2.5Y7/10 | | | 2.5Y7/10 | | | | |
| 1 = White (ex. Munsell Code 5Y 9/1 or 2.5Y 8.5/2) 2 = Yellow (ex. Munsell Code 2.5Y 8/10 or 7.5YR 7/14) 3 = Other (specify _____) | | | | | | | |
| 1 | | | 1 | | | Endosperm Type | |
| | | | | | | | |
| 1 = Normal Starch 3 = Waxy Starch 5 = High Lysine 7 = Other _____ | | | | 2 = High Amylose Starch 4 = High Protein 6 = High Oil | | | |
| 24.1 | 0.2 | 15 | 23.3 | 1.1 | 15 | gm Kernel Wt. | |
| gm Weight per 100 Kernels (unsized sample) | | | | | | | |
| 8. COB: | | | | Mean | | | |
| | Standard Deviation | Sample Size | | Standard Deviation | Sample Size | | |
| 23.8 | 0.9 | 30 | 25.3 | 0.6 | 30 | mm Cob Diameter | |
| 4 | | | 4 | | | Cob Color | |
| 2.5YR4/6 | | | 10R4/8 | | | Dark Reddish Orange | |
| 1 = White (ex. Munsell 5Y 9/1 or 2.5Y 8.5/2) 2 = Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 3 = Red (ex. Munsell 2.5R 4.8 or 10RP 4/8) 4 = Other (describe _____ Reddish Brown) | | | | | | | |
| 9. DISEASE RESISTANCE of the variety per se. Name the disease, the causative organism, the races or strains, and the resistance rating (rate from 1 (most susceptible) to 9 (most resistant). Trials should be conducted with resistant and susceptible check varieties, and ensure that adequate disease pressure is present in the trial (such as with inoculations or heavy disease pressure). EXAMPLE: 7 Helminthosporium Leaf Spot (<i>Bipolaris zeicola</i>) Race <u>2</u> | | | | DISEASE RESISTANCE of the comparison variety per se. Rate the same diseases as tested for the application variety. | | | |
| 7 | | | 5 | | | Eyespot (<i>Kabatiella zeae</i>) | |
| 5 | | | 6 | | | Gray Leaf Spot (<i>Cercospora zeae-maydis</i>) | |
| 5 | | | 6 | | | Southern Leaf Blight (<i>Bipolaris maydis</i>) | |
| 4 | | | 5 | | | Goss's Wilt (<i>Clavibacter michiganense</i> spp. <i>nebraskense</i>) | |

dbc 11/12/2013

| | |
|--|---|
| <p>Application Variety Data</p> <p>10. INSECT RESISTANCE of the variety per se: Name the insect, give its scientific name, and the resistance rating (rate from 1 (most susceptible) to 9 (most resistant). Trials should be conducted with resistant and susceptible check varieties, and ensure that adequate insect pressure is present in the trial (such as with inoculations or heavy insect pressure).</p> <p>EXAMPLE: European Corn Borer (<i>Ostrinia nubilalis</i>) 7 1st Generation (Typically Whorl Leaf Feeding)</p> | <p>Comparison Variety Data</p> <p>INSECT RESISTANCE of the comparison variety per se: Rate the same insects as tested for the application variety.</p> |
| <p>11. MOLECULAR MARKERS: (1 = data available but not supplied; 2 = data supplied)</p> <p><u> 2 </u> Isozymes <u> </u> RFLP's <u> </u> RAPD's</p> <p><u> </u> SSRs <u> </u> SNPs <u> 1 </u> Other (Specify) <u> </u> SNP &/or SSR</p> | <p>11. MOLECULAR MARKERS</p> <p><u> 2 </u> Isozymes <u> </u> RFLP's <u> </u> RAPD's</p> <p><u> </u> SSRs <u> </u> SNPs <u> 1 </u> Other <u> </u> SNP &/or SSR</p> |
| <p>12. AGRONOMIC TRAITS: Please place hybrid performance data in Exhibit D if desire to report it.</p> <p><u> </u> ND <u> </u> Kg/ha Yield of Variety Per Se (at grain maturity)</p> | <p>12. AGRONOMIC TRAITS</p> <p><u> </u> ND <u> </u> Kg/ha Yield of Variety Per Se</p> |
| <p>Application Variety Data</p> | <p>Comparison Variety Data</p> |

REFERENCES:

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

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

Farr, D. F., G. F. Bills, G. P. Chemuris, A.Y. Rossman. 1969. *Fungi on Plant and Plant Products in the United States*. The American Phytopathological Society, St. Paul, MN.

Inglett, G.E. (Ed.) 1970. *Corn: Culture, Processing, Products*. Avi Publishing Company, Westport, CT.

Jagerheimer, R. W. 1976. *Corn: Improvement, Seed Production, and Uses*. John Wiley & Sons, New York.

McGee, D.C. 1988. *Maize Diseases*. APS Press. St. Paul, MN. 150 pp.

Munsell Color Chart for Plant Tissues. Macbeth. P. O. Box 230, Newburgh, NY 12551-0230.

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

Shurtleff, M.C. 1980. *Compendium of Corn Diseases*. APS Press. St. Paul, MN. 105 pp.

Sprague, G.F., and J.W. Dudley (Editors). 1968. *Corn and Corn Improvement*. Third Edition. Agronomy Monograph 18. ASA, CSSA, SSSA, Madison, WI.

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

UPOV publications can be accessed at http://www.upov.int/en/publications/tg_tom/tg_index.html (look for "maize")

U.S. Department of Agriculture. 1936. 1937. Yearbook.

COMMENTS: (e.g., state how heat units were calculated, report any traits not listed on the form, and/or where data was collected. Continue in Exhibit D.)

The typical Heat Units calculation described in the exhibit C instructions was used in this exhibit.

ND=Not Determined

5. Tassel - Glume application and comparison variety Green with reddish purple stripes.

7. Kernel data, for line applying for plant variety protection, taken using seed from same seed lot as that sent to deposit. All other data trial location and date listed above.

Inbred Seed source from Syngenta Seeds, Inc., NP2536, PVP certificate 200600095 ; US Patent 7,534,942 is a proprietary line from Syngenta seed source 07PS2136766.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

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

**EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP**

| | | |
|--|--|--|
| 1. NAME OF APPLICANT(S) Syngenta Crop Protection AG | 2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER | 3. VARIETY NAME NPHD1001 |
| 4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) Schwarzwaldelle 215 Basel Switzerland 4058 | 5. TELEPHONE (Include area code) +41 61 323 11 11 | 6. FAX (Include area code) +41 61 323 12 12 |
| | 7. PVPO NUMBER PV# 201100433 | |

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

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country. YES NO

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

a. If the 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 the 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 (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

Answer to 9 and 10 b. is Switzerland

The variety for which Plant Variety Protection is hereby sought was developed by an employee, Adrian Dedreu, of Syngenta Seeds, Inc. By agreement between the employee and Syngenta Seeds, Inc. all right to any invention, discovered or development made by the employee while employed by Syngenta Seeds, Inc. are assigned to the Syngenta Crop Protection A.G. a Swiss Company with no right of any kind retained by the employee. +

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet 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 nationals 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 the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not 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 complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (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 USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

ST-470E (02-06) designed by the Plant Variety Protection Office using Word 2003

7/20/2011

REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved OMB NO 0581-0055

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not 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 complete this information collection is estimated to average 5 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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (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 USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT F
DECLARATION REGARDING DEPOSIT

| | | |
|---|---|---|
| NAME OF OWNER (S) Syngenta Crop Protection A.G. AG | ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) Schwarzwaldelle 215 Basel Switzerland 4058 | TEMPORARY OR EXPERIMENTAL DESIGNATION VARIETY NAME NPHD1001 |
| NAME OF OWNER REPRESENTATIVE (S) Dana Rewoldt | ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) PO Box 500 Slater IA 50244 | FOR OFFICIAL USE ONLY PVPO NUMBER PV# 201100433 |

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.

Dana Rewoldt
Signature

7-19-11
Date

03/21/2012 dbc