No. 9800106

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Monsanto Company

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 PURPOSE , 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.)

POTATO

'NL20-SHE'

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 twelfth day of September, in the year two thousand one.*

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

Attest:

Paul M. Zandomeni

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

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

9800106

FORM APPROVED - OMB NO. 0581-005

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

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

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

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

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*

MONSANTO COMPANY

N1268-013

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

NL20-SHE

3. VARIETY NAME

NL20-SHE

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*

Monsanto Company
700 Chesterfield Parkway North
St. Louis, MO 63198

5. TELEPHONE *(include area code)*

(314) 537-6547

6. FAX *(include area code)*

(314) 537-7085

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PVPO NUMBER: 9800106

FILING DATE: 2-6-98

7. GENUS AND SPECIES NAME

Solanum tuberosum

8. FAMILY NAME *(Botanical)*

Solanaceae

9. CROP KIND NAME *(Common name)*

Potato

FEES RECEIVED

FILING AND EXAMINATION FEE: $ 2450.00
DATE: 2-6-98

CERTIFICATION FEE: $ 320
DATE: 08/30/01

10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.) (Common name)*

Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION

Delaware

12. DATE OF INCORPORATION

4-19-33

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

Mr. Gary M. Bond
Monsanto Company, Mail Zone E2NA
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

2/13/2004 YDA.

14. TELEPHONE *(include area code)*

(314) 694-3412 2/13/2004
~~(402) 333-1550~~ YDA

15. FAX *(include area code)*

(314) 694-9009
~~(402) 333-1510~~ YDA 2/13/2004

16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow instructions on reverse)*

a. XX Exhibit A. Origin and Breeding History of the Variety
b. XX Exhibit B. Statement of Distinctness
c. XX Exhibit C. Objective Description of the Variety
d. ☐ Exhibit D. Additional Description of the Variety *(Optional)*
e. XX Exhibit E. Statement of the Basis of the Applicant's Ownership
f. XX Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in an approved public repository)*
g. XX Filing and Examination Fee ($2,450), made payable to "Treasurer of the United States" *(Mail to PVPO)*

17. DOES THE APPLICANT 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)*

XX YES *(If "yes," answer items 18 and 19 below)* ☒ NO *(If "no," go to item 20)* 07/18/01 SMP PER LETTER

18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

XX YES ☐ NO

19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

☐ FOUNDATION ☐ REGISTERED ☒ CERTIFIED

20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

☐ YES *(If "yes," give names of countries and dates)* ☒ NO

21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned applicant(s) is(are) the owner(s) 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.

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

SIGNATURE OF APPLICANT *(Owner(s))*		SIGNATURE OF APPLICANT *(Owner(s))*	
NAME *(Please print or type)* David M. Stark		NAME *(Please print or type)*	
CAPACITY OR TITLE VP & co-General Manager, Nature Mark	DATE 7/15/98	CAPACITY OR TITLE	DATE

STD-470 (03-96) *(Previous editions are to be destroyed)*

(See reverse for instructions and information collection burden statement)

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Application for Plant Variety Protection Certificate

NL20-SHE

Exhibit A: Origin and Breeding History of the Variety

Non-transformed variety: Shepody
Release Date: 1969
Breeder: Agriculture Canada
Published Release Data: 1980
Parentage: Bake King x F58050

Development: NL20-SHE to be marketed in association with the trade name NewLeaf Y™ Shepody was developed by

The Agricultural Group of Monsanto Company
700 Chesterfield Parkway North
Chesterfield, MO 63198
(314) 537-6547

Description of Transformation System and Plasmid Utilized NL20-SHE

The NL20-SHE potato for which Plant Variety Protection is requested contain the CryIIIA gene from Bacillus thuringiesis subsp. tenebrionis which encodes the Colorado potato beetle-active protein, the gene encoding the coat protein of potato virus Y, and the nptII gene from the prokaryotic transposon Tn5 which encodes for the enzyme neomycin phosphortansferase II. These genes were stably transferred into the genome of potato plants using Agrobacterium tumefaciens mediated transformation utilizing a binary double border expression vector, PV-STMT15. The source or the genes and construction of analogous vector systems are described by Perlak et al. (1995) and by Lawson et al. (1990).

Agrobacterium tumefaciens Transformation System

The agrobacterium tumefaciens transformation method has been reviewed by Klee and Rogers (1998). The transformation vector contains well-characterized DNA segments required for selection and replication of the plasmid vector in bacteria and transfer of the T-DNA into plant cells. The plant expression vector was assembled in Escherichia coli and mated into the ABI Agrobacterium strain. The ABI strain contains the disarmed pTi58 plasmide PmP90RK which does not carry the T-DNA phytohormones (Konez and Schell, 1986). Therefore the Agrobacterium is unable to cause crown gall disease and is no longer considered a threat as a plant pest (Huttner et al., 1992). The pMP90RK plasmid was engineered to provide the trfA gene functions required for autonomous replication of the plasmid vector after conjugation into the ABI strain. The ABI Agrobacterium strain containing the binary vector was added to potato stem sections (Newell et al., 1991) in tissue culture dishes, the T-DNA, which includes the cryIIIA and nptII genes, was transferred into the genome of individual potato cells thereby allowing selection in kanamycin. After a few days, the residual Agrobacterium cells were killed using different antibiotics. Subsequently, the potato tissues were treated to stimulate regeneration of transgenic cells into shoots and ultimately plantlets were grown in soil and assayed for resistance to damage by the Colorado potato beetle and resistance to infection by potato virus Y.

References

S. Huttner and C Arntzen et al., Revising Oversight of Genetically Modified Plants. Biot/Technology 10:967-971

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H. Klee, and S. Rogers. Plant Gene Vectors and Genetic Transformation: Plant Transformation Systems Based on the Use of Agrobacterium tumefaciens. Cell culture ans Somatic Cell genetis of Plants. 6:1-23 (1989).

C. Konecz and J. Schell, The Promoter of TL-DNA Gene F Controls the Tissue-Specific Expression of Chimeric Genes Carried by Novel Type of Agrobacterium Binary Vector. Mol. Gen. Genet. 204:383-396 (1986).

F. Perlak and T. Stone, et. al., Genetically Improved Potatoes: Protection from Damage by Colorado Potato Beetles. Plant Molecular Biology 22:313-321 (1993)

C. Newell and R. Rozman, et. al., Agrobacterium-mediated transformation of Aloanum tuberosum L. Cv. Russet Burbank, Plant Cell Rep. 10:30:34 (1991).

C. Lawson, W. Kaniewski et al., Engineering Resistance to Mixed Virus Infection in a Commercial Potato Cultivar: Resistance to Potato Viruses X and Potato Virus Y in Transgenic Russet Burbank. Bio/Technology 8:127-134.

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Statement of Uniformity and Stability

The potato variety NL20-SHE has been reproduced as seed by Monsanto/NatureMark since 1994 in evaluation trials and for the purpose of seed increase. A total of approximately four acres of seed was generated in the United States and Canada in 1995. The seed production has been inspected by certification agency officials of Agriculture and Agri-Food Canada in Prince Edward Island and New Brunswick. The variety has also been examined by certification officials in Maine. In that time the variety has produced typical plants and tubers in a very predictable and uniform manner consistent with the Shepody variety from which it was derived. The frequency of off-types, mutations and variants can be expected to be the same as with the untransformed Shepody.

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Exhibit B: Distinctness Statement

The potato variety NL-20-SAE is distinct from all other potato varieties in that it is a genetically modified Shepody which constitutively produced the cryIIIA protein which prevents feeding damage to the plant by the Colorado potato beetles (CPB) leptinotarsa decemlineata, the most serious insect pest of potatoes. This variety is also resistant to infection by potato virus Y (PVY). The variety is distinguishable from non-transformed Shepody by the resistance to Colorado Potato Beetle and PVY provided through the presence of the cryIIIA protein produced in the plant cells due to the presence of the gene obtained from Bacillus thuringeinsis subsp. tenebrionis. The plants resist PVY due to the presence of the gene encoding for the coat protein of potato virus Y.

Agronomic evaluation of the CPB and PVY resistant potato lines consisting of plant vigor, growth habit characteristics, and general disease susceptibility, have shown these lines to be equivalent to the parental Shepody line.

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NAME OF APPLICANT(S)	FOR OFFICIAL USE ONLY
MONSANTO COMPANY	PVPO NUMBER 9800106
ADDRESS (*Street and No. or R.F.D. No., City, State, and Zip Code*) 700 Chesterfield Village Parkway North St. Louis, MO 63198	VARIETY (V) NAME NL 20-SHE
	TEMPORARY OR EXPERIMENTAL DESIGNATION

REFERENCE VARIETIES: Enter the reference variety name in the appropriate box

Reference Variety 1 (R1)	Reference Variety 2 (R2)	Reference Variety 3 (R3)	Reference Variety 4 (R4)
Shepody			

1. MARKET CHARACTERISTICS:

MARKET CLASS:

1 = Yellow-flesh tablestock; 2 = Round-white tablestock; 3 = Chip-processing; 4 = Frozen-processing;
5 = Russet tablestock; 6 = Other_____.

V	R1	R2	R3	R4
4	4			

2. PLANT CHARACTERISTICS:

GROWTH HABIT: *(See figure 1)*
3 = Erect (>45° with ground); 5 = Semi-erect (30-45° with ground); 7 = Spreading.

V	R1	R2	R3	R4
5	5			

TYPE:
1 = Stem (foliage open, stems clearly visible); 2 = Intermediate; 3 = Leaf (Foliage closed, stems hardly visible)

V	R1	R2	R3	R4
3	3			

MATURITY: Days after planting (DAP) at vine senescence

V	R1	R2	R3	R4
Not available	Not available			

PLANTING DATE:

V	R1	R2	R3	R4
June 7, 1999	June 7, 1999			

REGION/AREA:

V	R1	R2	R3	R4
North Tilley, NB	North Tilley, NB			

Figures in red transferred from original Exhibit C 04/23/01 SNP

MATURITY CLASS:
1 = Very Early (<100 DAP); 2 = Early (100-110 DAP); 3 = Mid-season (111-120 DAP); 4 = Late (121-130 DAP); 5 = Very Late (>130 DAP).

V	3	R1	3	R2		R3		R4	

3. STEM CHARACTERISTICS: *Measure at early first bloom*

* STEM ANTHOCYANIN COLORATION:
1 = Absent; 3 = Weak; 5 = Medium; 7 = Strong; 9 = Very Strong

V	3	R1	3	R2		R3		R4	

STEM WINGS: *(See figure 12)*
1 = Absent; 3 = Weak; 5 = Medium; 7 = Strong; 9 = Very Strong

V	7	R1	7	R2		R3		R4	

4. LEAF CHARACTERISTICS:

LEAF COLOR: *(Observe fully developed leaves located on middle $^1/_3$ of plant)*
1 = Yellowish-green; 2 = Olive-green; 3 = Medium green; 4 = Dark green; 5 = Grey-green; 6 = Other_____

V	1-2	R1	1-2	R2		R3		R4	

LEAF COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart
(Observe fully developed leaves located on middle $^1/_3$ of plant & circle the appropriate color chart)

V	146A	R1	146A	R2		R3		R4	

LEAF PUBESCENCE DENSITY:
1 = Absent; 2 = Sparse; 3 = Medium; 4 = Thick; 5 = Heavy

V	3	R1	3	R2		R3		R4	

LEAF PUBESCENCE LENGTH:
1 = None; 2 = Short; 3 = Medium; 4 = Long; 5 = Very long

V	2	R1	2	R2		R3		R4	

(Note: Descriptor #19 can be used to describe the type and length of the glandular trichomes observed.)

* LEAF SILHOUETTE: *(See figure 2)*
1 = Closed; 3 = Medium; 5 = Open

V	3	R1	3	R2		R3		R4	

PETIOLES ANTHOCYANIN COLORATION:
1 = Absent; 3 = Weak; 5 = Medium; 7 = Strong; 9 = Very Strong

V	1	R1	1	R2		R3		R4	

LEAF STIPULES SIZE: *(See figure 13)*
1 = Absent; 3 = Small; 5 = Medium; 7 = Large

V	5	R1	5	R2		R3		R4	

TERMINAL LEAFLET SHAPE: *(See figure 3 & 11)*
1 = Narrowly ovate; 2 = Medium ovate; 3 = Broadly ovate; 4 = Lanceolate; 5 = Elliptical;
6= Obovate; 7 = Oblong; 8 = Other_____

V	2	R1	2	R2		R3		R4	

TERMINAL LEAFLET TIP SHAPE: *(See figure 4 & 11)*
1 = Acute; 2 = Cuspidate; 3 = Acuminate; 4 = Obtuse; 5 = Other_____

V	1-3	R1	1-3	R2		R3		R4	

* TERMINAL LEAFLET BASE SHAPE: *(See figure 5 & 11)*
1 = Cuneate; 2 = Acute; 3 = Obtuse; 4 = Cordate; 5 = Truncate; 6 = Lobed; 7 = Other_____

V	3-4	R1	3-4	R2		R3		R4	

* TERMINAL LEAFLET MARGIN WAVINESS:
1 = Absent; 2 = Slight; 3 = Weak; 4 = Medium; 5 = Strong

V	4	R1	4	R2		R3		R4	

NUMBER OF PRIMARY LEAFLET PAIRS: *(See figure 11)*

AVERAGE:

V	4.0	R1	4.2	R2		R3		R4	

RANGE:

V	4 to 5	R1	4 to 5	R2	to	R3	to	R4	to

PRIMARY LEAFLET TIP SHAPE: *(See figure 4 & 11)*
1 = Acute; 2 = Cuspidate; 3 = Acuminate; 4 = Obtuse; 5 = Other_____

V	1	R1	1	R2		R3		R4	

* **PRIMARY LEAFLET SIZE:**

1 = Very Small; 2 = Small; 3 = Medium; 4 = Large; 5 = Very Large

V	R1	R2	R3	R4

PRIMARY LEAFLET SHAPE: *(See figure 3 & 11)*

1 = Narrowly ovate; 2 = Medium ovate; 3 = Broadly ovate; 4 = Lanceolate; 5 = Elliptical; 6= Obovate; 7 = Oblong; 8 = Other_____

V	R1	R2	R3	R4
1	1			

PRIMARY LEAFLET BASE SHAPE: *(See figure 5 & 11)*

1 = Cuneate; 2 = Acute; 3 = Obtuse; 4 = Cordate; 5 = Truncate; 6 = Lobed; 7 = Other_____

V	R1	R2	R3	R4
4	4			

NUMBER OF SECONDARY AND TERTIARY LEAFLET PAIRS: *(See figure 11)*

AVERAGE:

V	R1	R2	R3	R4
3.3	3.3			

RANGE:

V	R1	R2	R3	R4
2 to 6	2 to 5	to	to	to

5. INFLORESCENCE CHARACTERISTICS:

NUMBER OF INFLORESCENCE / PLANT:

AVERAGE:

V	R1	R2	R3	R4
2.3	2.0			

RANGE:

V	R1	R2	R3	R4
2 to 3	2 to 2	to	to	to

NUMBER OF FLORETS / INFLORESCENCE:

AVERAGE:

V	R1	R2	R3	R4
6.7	9.7			

RANGE:

V	R1	R2	R3	R4
3 to 10	6 to 16	to	to	to

* **COROLLA INNER SURFACE COLOR CHART VALUE:** Royal Horticulture Society Color Chart or Munsell Color Chart

(Measure predominant color of newly open flower & circle the appropriate color chart)

V	R1	R2	R3	R4
76A	76A			

* COROLLA INNER SURFACE COLOR: *(Measure predominant color of newly open flower)*
1 = White; 2 = Red-violet; 3 = Blue-violet; 4 = Other_____

V		R1		R2		R3		R4	

COROLLA SHAPE: *(See figure 6)*
1 = Very rotate; 2 = Rotate; 3 = Pentagonal; 4 = Semi-stellate; 5 = Stellate

V	3	R1	3	R2		R3		R4	

CALYX ANTHOCYANIN COLORATION:
1 = Absent; 3 = Weak; 5 = Medium; 7 = Strong; 9 = Very strong

V	1-3	R1	1-3	R2		R3		R4	

ANTHER COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart
(Measure when newly opened flower is fully expanded and circle the appropriate color chart)

V	14A	R1	14A	R2		R3		R4	

ANTHER SHAPE: *(See figure 7)*
1 = Broad cone; 2 = Narrow cone; 3 = Pear shape cone; 4 = Loose; 5 = Other_____

V	1	R1	1	R2		R3		R4	

POLLEN PRODUCTION:
1 = None; 3 = Some; 5 = Abundant

V	N/A	R1	N/A	R2		R3		R4	

STIGMA SHAPE: *(See figure 8)*
1 = Capitate; 2 = Clavate; 3 = Bi-lobed

V	1	R1	1	R2		R3		R4	

STIGMA COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart
(Circle the appropriate color chart)

V	148B	R1	148B	R2		R3		R4	

BERRY PRODUCTION: *(Under field conditions)*
1 = None; 3 = Low; 5 = Moderate; 7 = Heavy; 9 = Very heavy

V	N/A	R1	N/A	R2		R3		R4	

5. TUBER CHARACTERISTICS:

* PREDOMINANT SKIN COLOR:

1 = White; 2 = Light Yellow; 3 = Yellow; 4 = Buff; 5 = Tan; 6 = Brown; 7 = Pink; 8 = Red; 9 = Purplish-red; 10 = Purple; 11 = Dark purple-black; 12 = Other_____

V	R1	R2	R3	R4
1	1			

PREDOMINANT SKIN COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart
(Circle the appropriate color chart)

V	R1	R2	R3	R4
161C	161C			

SECONDARY SKIN COLOR:

1 = Absent; 2 = Present, please describe: _____

V	R1	R2	R3	R4
1	1			

SECONDARY SKIN COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart
(Circle the appropriate color)

V	R1	R2	R3	R4

SECONDARY SKIN COLOR DISTRIBUTION:

1 = Eyes; 2 = Eyebrows; 3 = Splashed; 4 = Scattered; 5 = Spectacled; 6 = Stippled; 7 = Other_____

V	R1	R2	R3	R4

SKIN TEXTURE:

1 = Smooth; 2 = Rough (flaky); 3 = Netted; 4 = Russetted; 5 = Heavily russetted; 6 = Other_____

V	R1	R2	R3	R4
1	1			

* TUBER SHAPE: *(See figure 10)*

1 = Compressed; 2 = Round; 3 = Oval; 4 = Oblong; 5 = Long; 6 = Other_____

V	R1	R2	R3	R4
4-5	4-5			

TUBER THICKNESS:

1 = Round; 2 = Medium thick; 3 = Slightly flattened; 4 = Flattened; 5 = Other_____

V	R1	R2	R3	R4
2	2			

TUBER LENGTH (mm):

AVERAGE:

V	R1	R2	R3	R4
100.6	97.1			

RANGE:

V	R1	R2	R3	R4
82 to 126	70 to 119	to	to	to

STANDARD DEVIATION:

V	R1	R2	R3	R4
10.6	13.6			

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	R1	R2	R3	R4
175.9	175.2			

TUBER WIDTH (mm):

AVERAGE:

V	R1	R2	R3	R4
59.5	61.6			

RANGE:

V	R1	R2	R3	R4
47 to 69	55 to 66	to	to	to

STANDARD DEVIATION:

V	R1	R2	R3	R4
4.9	3.3			

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	R1	R2	R3	R4
175.6	175.2			

TUBER THICKNESS (mm):

AVERAGE:

V	R1	R2	R3	R4
48.2	48.6			

RANGE:

V	R1	R2	R3	R4
42 to 55	42 to 58	to	to	to

STANDARD DEVIATION:

V	R1	R2	R3	R4
3.2	4.6			

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	R1	R2	R3	R4
175.9	175.2			

TUBER EYE DEPTH:

1 = Protruding; 2 = Shallow; 3 = Intermediate; 4 = Deep; 5 = Very deep

V	R1	R2	R3	R4
2	2			

TUBER LATERAL EYES
1 = Protruding; 2 = Shallow; 3 = Intermediate; 4 = Deep; 5 = Very deep

V	2	R1	2	R2		R3		R4	

NUMBER EYE / TUBER:

AVERAGE:

V	11.6	R1	12.3	R2		R3		R4	

RANGE:

V	8 to 14	R1	11 to 14	R2	to	R3	to	R4	to

DISTRIBUTION OF TUBER EYES:
1 = Predominantly apical; 2 = Evenly distributed

V	2	R1	2	R2		R3		R4	

PROMINENCE OF TUBER EYEBROWS:
1 = Not prominent; 2 = Slight prominence; 3 = Medium prominence; 4 = Very prominent; 5 = Other_____

V	3	R1	3	R2		R3		R4	

* PRIMARY TUBER FLESH COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart
(Circle the appropriate color chart)

V	158B	R1	158B	R2		R3		R4	

SECONDARY TUBER FLESH COLOR:
1 = Absent; 2 = Present, please describe: _____

V	1	R1	1	R2		R3		R4	

SECONDARY TUBER FLESH COLOR CHART VALUE: Royal Horticulture Society Color Chart or Munsell Color Chart
(Circle the appropriate color chart)

V		R1		R2		R3		R4	

NUMBER OF TUBERS / PLANT:
1 = Low (<8); 2 = Medium (8 -15); 3 = High (>15)

V	1	R1	1	R2		R3		R4	

6. DISEASES CHARACTERISTICS:

DISEASES REACTION: 0 = NOT TESTED; 1 = RESISTANT; 3 = MODERATELY RESISTANT;
5 = MODERATELY SUSCEPTIBLE; 7=SUSCEPTIBLE; 9=HIGHLY SUSCEPTIBLE

BACTERIAL RING ROT, FOLIAR REACTION:

V	R1	R2	R3	R4
7				

BACTERIAL RING ROT, TUBER REACTION:

V	R1	R2	R3	R4
7				

LATE BLIGHT:

V	R1	R2	R3	R4
7				

PLRV (LEAF ROLL):

V	R1	R2	R3	R4
7				

PVX:

V	R1	R2	R3	R4
7				

PVY:

V	R1	R2	R3	R4
1				

OTHER: PVA

V	R1	R2	R3	R4
1				

OTHER: _____

V	R1	R2	R3	R4

7. PESTS CHARACTERISTICS:

PEST REACTION: 0 = NOT TESTED; 1 = RESISTANT; 3 = MODERATELY RESISTANT;
5 = MODERATELY SUSCEPTIBLE; 7=SUSCEPTIBLE; 9=HIGHLY SUSCEPTIBLE

GOLDEN NEMATODE:

V	R1	R2	R3	R4
7				

OTHER: CPB

V	R1	R2	R3	R4
1				

8. GENE TRAITS:

INSERTION OF GENES: [X] YES [ ] NO

If YES, describe the gene(s) introduced or attach information:

9. QUALITY CHARACTERISTICS:

CHIEF MARKET:

SPECIFIC GRAVITY (wt. air /wt. air - wt. water)
1 < 1.060; 2 = 1.060-1.069; 3 = 1.070-1.079; 4 = 1.080-1.089; 5 > 1.090

V	3	R1		R2		R3		R4	

TOTAL GLYCOALKALOID CONTENT (mg. / 100 g. fresh tuber)

V	5	R1		R2		R3		R4	

OTHER QUALITY CHARACTERISTICS: Describe any other quality characteristics that may aid in identification, (e.g. chip-processing, french fry processing, baking, boiling, after-cooking darkening). Please attach data and corresponding protocol.

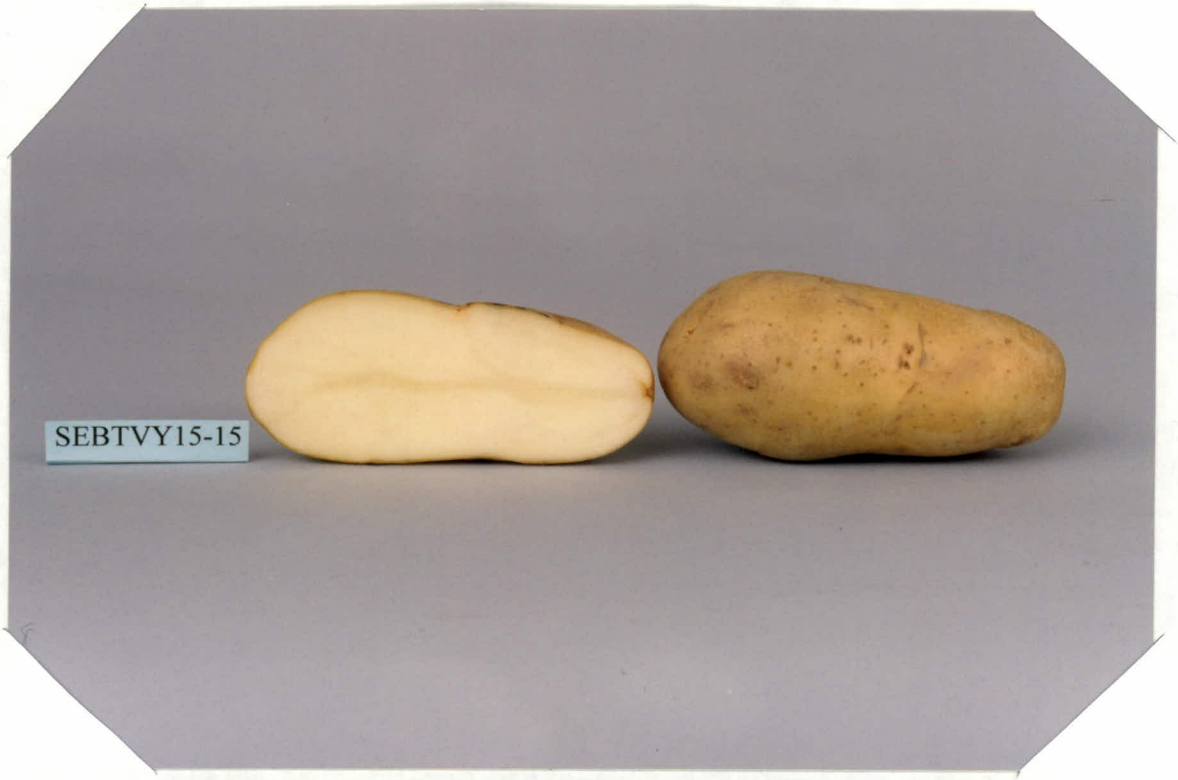
11. CHEMICAL IDENTIFICATION:

Describe chemical traits of the candidate variety that aid in its identification (e.g. protein or DNA electrophoresis). Please attach data and the corresponding protocol.

12. ADDITIONAL COMMENTS AND CHARACTERISTICS:

Include any additional descriptors that would be useful in distinguishing the candidate variety.

SEBTVY15-15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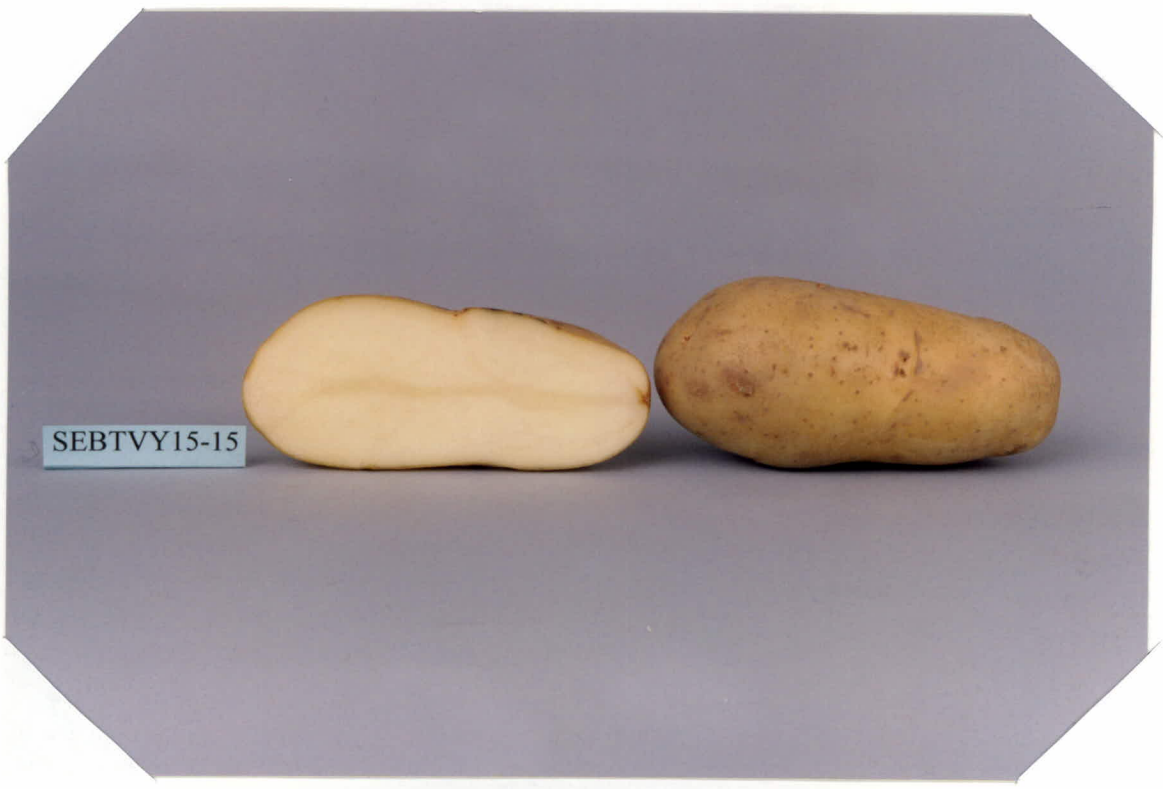

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

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

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

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
MONSANTO COMPANY	NL20-SHE	9800106

4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country)	5. TELEPHONE (include area code)	6. FAX (include area code)
700 Chesterfield Village Parkway North St. Louis, MO 63198	314 537-6547	314 537-7085

7. PVPO NUMBER

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

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

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

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?
[ ] YES [ ] NO If no, give name of country

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?
[ ] YES [ ] NO If no, give name of country

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

PLEASE NOTE:

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

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

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by 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 final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

...rding to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, ...arching 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 its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

9800106

Exhibit F: Verification of Future Deposits

The applicant verifies that tissue culture of NL20-SHE variety potatoes which are the subject of the present application will be deposited and maintained in a public repository at such time as requiered by the Secretary.

Rothwell, Figg, Ernst & Kurz

By_____
Robert J. Jondle

13906 Gold Circle
Suite 204
Omaha, Nebraska 68144