No. 9700231

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

'NL10-ATL'

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.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

9700231 - cgm 7-22-97

REPRODUCE LOCALLY. *Include form number and date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE 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).

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

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

3. VARIETY NAME 02/01/01
~~NL Atlantic~~ TMP PER
NL10-ATL LETTER

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
700 Chesterfield Parkway North
St. Louis, MO 63198

6. TELEPHONE *(Include area code)*
(314) 537-6547

6. FAX *(Include area code)*
(314) 537-7085

FOR OFFICIAL USE ONLY
PVPO NUMBER 9700231
DATE RECEIVED 3/14/97
FILING AND EXAMINATION FEE $ 2,450.00
DATE 3/14/97
CERTIFICATION FEE $ 300.00
DATE 7/2/97

7. GENUS AND SPECIES NAME
SOLANUM TUBEROSUM

8. FAMILY NAME *(Botanical)*
SOLANACEAE

9. CROP KIND NAME *(Common name)*
POTATO

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

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Delaware

12. DATE OF INCORPORATION
April 19, 1933

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
2/13/04 DPA
Mr. Gary M. Bond
Monsanto Company, Mail Zone E2NA
800 North Lindbergh Boulevard
St. Louis, Missouri 63167
~~ROBERT J. JONDLE~~
~~COTHWELL P166 ERNST & KURZ~~
up of
LLP
~~555 13th ST N.W. STE. 701E TOWER~~
~~JMP PER LETTER DATED 1/29/04~~
. Ninth Floor, East Tower
~~WASHINGTON DC 20004~~
Washington, D. C. 20005-3918

14. TELEPHONE *(Include area code)*
(314) 694-3412
~~(202) 861-3033~~

15. FAX *(Include area code)*
~~(202) 822-0944~~
(314) 694-9009

16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow instructions on reverse)*
- a. ☒ Exhibit A. Origin and Breeding History of the Variety
- b. ☒ Exhibit B. Statement of Distinctness
- c. ☒ Exhibit C. Objective Description of the Variety
- d. ☒ Exhibit D. Additional Description of the Variety
- e. ☒ Exhibit E. Statement of the Basis of the Applicant's Ownership
- f. ☐ Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository)*
- g. ☒ 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)*
☐ YES *(If "yes," answer Items 18 and 19 below)* ☒ NO *(If "no," go to Item 20)*

18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ 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
U.S. (March 15, 1996)

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 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

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

SIGNATURE OF APPLICANT *(Owner(s))*
Mark F. Wachter gfb

NAME *(Please print or type)*
Mark F. Wachter

CAPACITY OR TITLE
Patent Counsel

DATE
3/12/97

SIGNATURE OF APPLICANT *(Owner(s))*

NAME *(Please print or type)*
Mark F. Wachter
Intellectual Property Counsel
Authorized to sign this document for
Monsanto Company by resolution dated
April 15, 1996 of the Board of Directors

CAPACITY OR TITLE

DATE

SD-470 (04-96) *(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
~~NL Atlantic~~ NL10-ATL 02/01/01 JMP PER LETTER

EXHIBIT A

Origin and Breeding History of the Variety.

Non-transformed variety: Atlantic

Release Date: July 16, 1976
Breeder: Agricultural Research Service of the United States Department of Agriculture, the Florida Experiment Station, the Virginia Tree and Ornamentals Research Station, Norfolk, the New Jersey Agricultural Experiment Station, and the Maine Agricultural Experiment Station.
Published Release Data: American Potato Journal Vol. 55, 1978
Parentage: USDA Seedling B5141 (Lenape)X Wausson = Atlantic USDA Seedling B6987-36

NL10-ATL
~~NL Atlantic~~: Transgenic Atlantic

02/01/01 JMP PER LETTER

NL Atlantic to be marketed in association with the trade name NewLeaf™ Atlantic was developed by:

The Agricultural Group of Monsanto Company
700 Chesterfield Parkway North
Chesterfield, MO 63198
Tel: (314) 536-6547
Fax: (314) 537-7085

DESCRIPTION OF TRANSFORMATION SYSTEM AND PLASMID UTILIZED

The NL Atlantic potato lines for which a Plant Variety Protection Certificate is requested contain the *cryIIIA* gene from *Bacillus thuringiesis* subsp. *Tenebrionis* which encodes the CPB-active protein and the *nptII* gene from the prokayrotic transposon Tn5 which encodes for the enzyme neomycin phosphotransferase II which confers resistance to kanamycin and serves as a marker during the transformation process. These genes were stably transferred into the genome of potato plants using *Agrobacterium tumefaciens* mediated transformation utilizing binary double border expression vector, PV-ST8T04. The source of the genes and construction of an analogous vector system is described by Periak *et al.* (1995).

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Agrobacterium tumefaciens Transformation System

The *Agrobacterium tumefaciens* transformation method has been reviewed by Klee and Rogers (1989). 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 plasmid pMP90RK which does not carry the T-DNA phytohormone genes (Koncz 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 *trf*A 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 of 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.

References:

Huttner, S. L., Amtzen, C., Beachy, R., Breuning, G., Nester, E., Quaiset, C. and Vidaver, A., 1992. Revising Oversight of Genetically Modified Plants. Bio/Technology 10:967-971.

Klee, H. J. and Rogers, S. G., 1989. Plant Gene Vectors and Genetic Transformation: Plant Transformation Systems based on the use of *Agrobacterium tumefaciens*. Cell Culture and Somatic Cell Genetics of Plants 6:1-23.

Koncz, C and Schell, J. 1986. The Promoter of T_L-DNA Gene 5 Controls the Tissue-Specific Expression of Chimeric Genes carried by a Novel Type of *Agrobacterium* Binary Vector. Mol.. Gen. Genet. 204:383-396.

Periak, F.J., Stone, T. B., Muskopf, Y.M., Petersen, L.J., Parker, G. B., McPherson, S.A., Wyman, J., Love S., Reed, G., Biever, D. and Fischhoff, D. A. 1993. Genetically Improved Potatoes: Protection from Damage by Colorado Potato Beetles, Plant Molecular Biology 22:313-321.

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Newell, G.A., Rozman, R., Hinchee, M. A., Lawson, E. C., Haley, L., Sanders, P., Kaniewki, W., Tumer, N.E., Horsch, R.B. and Fraley, A. T. 1991. *Agrobacterium*-mediated transformation of *Solanium tuberosum* L. Cv. Russet Burbank, Plant Cell Rep. 10:30-34.

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APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

~~NL Atlantic~~ NL10-ATL 02/01/01 JMI PER LETTER

EXHIBIT B

Statement of Distinctiveness

The potato variety NL Atlantic is distinct from all other potato varieties in that it is a genetically modified Atlantic which constitutively produces the cryIIIa protein which prevents feeding damage to the plant by the Colorado Potato Beetle (CPB) *leptinotarsa decemtineata*, the most serious insect pest of potatoes. The variety is distinguishable from non-transformed Atlantic by the resistance to Colorado Potato Beetle provided through the presence of the cryIIIa protein produced in the plant cells due to presence of the gene obtained from *Bacillus thuringeinsis* subsp. *tenebrionis*.

Agronomic evaluations of this CPB resistant potato variety consisting of plant vigor, growth habit characteristics, and general disease susceptibility, have shown this variety to be equivalent to the parental Atlantic potatoes.

REPRODUCE LOCALLY. *Include form number and date on reproductions.* FORM APPROVED - OMB NO. 0581-0055

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

EXHIBIT C
OBJECTIVE DESCRIPTION OF VARIETY
POTATO (*Solanum tuberosum* L.)

Public reporting burden for this collection of information is estimated to average __ minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the form. Send comments regarding this burden estimate or any other aspects of this collection of information, including suggestions for reducing this burden, to USDA, OIRM, Clearance Officer, AG Box 7630, Washington, DC 20250, regarding OMB No. 0581-0055. When replying, refer to OMB number and form number you your letter.

INSTRUCTIONS

The Objective Description Form:
The objective description form lists characteristics to be used as the basis for developing the description of potato varieties. It is designed to guide the applicant in describing a variety in detail so a meaningful comparison with other potato varieties can be accomplished. It is recommended that this form be completed in as much detail as possible to ensure an accurate description. Please fill in the requested data and place the appropriate number that describes the varietal characters typical of this potato variety and the reference varieties in the respective boxes.

Test Guidelines:
Any statistical and trial (field test) data that may be necessary to support the variety description should be attached to this form. Please include for trial data the plot size, number of replications, number of plants, plant spacing, trial locations and growing periods. Trials should normally be conducted at one place, in the region that the variety has been adapted for, with a minimum of one growing period in the United States. All comparative data should be determined from varieties entered in the same trials. The size of the plots should be such that plants or plant parts of plants may be removed for measuring and counting without prejudice to the observations which must be made at the end of the growing period. As a minimum, each test should include a total of 60 plants which should be divided between two or more replicates. Separate plots for observation and measuring can only be used if they have been subject to similar environmental conditions. To determine color for a plant or plant parts a recognized standard color chart must be used such as the Royal Horticultural Society (R.H.S.) Color Chart.

Reference Varieties:
The application variety should be compared to a set of reference varieties. The reference varieties should be market class standard varieties currently grown in the United States and the varieties most similar. The following varieties are recommended as market class standards to be used as reference varieties:

Yellow-flesh tablestock	**Yukon Gold**
Round-white tablestock	**Superior**
Chip-processing	**Atlantic, Snowden, Norchip**
Frozen-processing	**Russet Burbank**
Russet tablestock	**Russet Burbank, Russet Norkotah, Goldrush**
Red tablestock	**Red Pontiac, Red Norland, Red Lasoda**

Characteristics:
The plant type and growth habit characteristics are collected at early first bloom. Figure 1 is supplied to help visualize the growth habit. For this descriptor, look at the stems rather than the stems and foliage. Plant maturity is measured at natural vine senescence.

Stem characteristics are also collected at early bloom. Stem anthocyanin coloration is divided into two descriptors: Location and intensity. Figure 12 is supplied to give an example of stem wings.

Leaf characteristics are observed at early first bloom. Fully-developed leaves located on the middle third of the plant should be used. Leaf pubescence refers to general trichomes. Figure 2 is supplied for examples of leaf silhouette. Figure 3 should be used to describe terminal and primary leaflet shape. Figures 4 and 5 are used to describe the terminal and primary leaflet shape of tip and base, respectively. To measure the total number of primary leaflets pairs, collect 10 fully- developed petioles (with leaves attached from each replication and take the average number of secondary and tertiary leaflets. Figure 11 is supplied to define leaf characteristics. Glandular trichomes should be described through descriptor #12 (Additional Comments and Characteristics). Leaf stipules are shown in figure 13 for visual definition.

Inflorescence characteristics should be measured at early first bloom. Figures 6 and 7 are supplied to describe corolla and anther shape, respectively. Corolla, calyx, anther, stigma and pollen should be observed on newly opened flowers. Berry production should be based on field-grown plants rather than greenhouse plants.

Tuber characteristics should be observed following harvest. Figures 9 and 10 are available to describe distribution of secondary color and tuber shape, respectively.

Disease and pest reactions should be based upon specific tests rather than field observations. Other diseases or pests reactions not requested can be described if it is felt that it would be helpful to the description.

Quality characteristics should be described according to the market use.

If the plant is transgenic, this gene insertion(s) should be described.

Chemical identification and any other characteristics can be describe if they are helpful in distinguishing the variety.

A rating system of 1-9 provides a scale for describing most characteristics in this form. Characteristic may be rated with intermediate values where the characteristic grades gradually from one extreme to another. For example where the states for a characteristic are described as: 3 = Small; 5 = Medium; 7 = Large; the other values of 1, 2, 4, 6, 8, or 9 may be selected.

Legend:

V = Application Variety

R1-R4 = Reference Varieties

*

= Both reference variety(ies) and application variety must be described for characteristics designated on the form with an asterisk.

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NAME OF APPLICANT(S)	FOR OFFICIAL USE ONLY
MONSANTO	PVPO NUMBER 9700231
ADDRESS (*Street and No. or R.F.D. No., City, State, and Zip Code*) MONSANTO COMPANY 700 Chesterfield Parkway North St. Louis, MO 63198	VARIETY (V) NAME NL20-ATL ~~NL Atlantic~~ SMP PER 12/20/99 FAX 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)
Atlantic			

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
2-3	2-3			

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
3-5	3-5			

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

V	R1	R2	R3	R4
2	2			

MATURITY: Days after planting (DAP) at vine senescence

V	R1	R2	R3	R4
100-110	100-110			

PLANTING DATE:

V	R1	R2	R3	R4

REGION/AREA:

V	R1	R2	R3	R4

FIGURES IN RED ADDED PER LETTER 01/04/00 SMP

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	2	R1	2	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	5	R1	5	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	3-4	R1	3-4	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		R1		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		R1		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	

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

V	R1	R2	R3	R4
3	3			

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

V	R1	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	R1	R2	R3	R4
3	3			

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

V	R1	R2	R3	R4
2	2			

* TERMINAL 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
3	3			

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

V	R1	R2	R3	R4
3	3			

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

AVERAGE:

V	R1	R2	R3	R4

RANGE:

V	R1	R2	R3	R4
3 to 4	3 to 4	to	to	to

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

V	R1	R2	R3	R4
2	2			

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* PRIMARY LEAFLET SIZE:

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

V	R1	R2	R3	R4
4	4			

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
3	3			

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
3	3			

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

AVERAGE:

V	R1	R2	R3	R4

RANGE:

V	R1	R2	R3	R4
9 to 12	9 to 12	to	to	to

5. INFLORESCENCE CHARACTERISTICS:

NUMBER OF INFLORESCENCE / PLANT:

AVERAGE:

V	R1	R2	R3	R4

RANGE:

V	R1	R2	R3	R4
to	to	to	to	to

NUMBER OF FLORETS / INFLORESCENCE:

AVERAGE:

V	R1	R2	R3	R4

RANGE:

V	R1	R2	R3	R4
6 to 12	6 to 12	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
2	2			

76B WHITE TIPS R2=76B & 76A WHITE TIPS JMP PER 12/20/99 FAX

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* **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
2	2			

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

V	R1	R2	R3	R4
5	5			

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

V	R1	R2	R3	R4
3	3			

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	R1	R2	R3	R4

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

V	R1	R2	R3	R4
2	2			

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

V	R1	R2	R3	R4
3	3			

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

V	R1	R2	R3	R4
1	1			

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

V	R1	R2	R3	R4

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

V	R1	R2	R3	R4
3	3			

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	4	R1	4	R2		R3		R4	

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

V		R1		R2		R3		R4	

SECONDARY SKIN COLOR:

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

V	1	R1	1	R2		R3		R4	

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 lightly netted

V	6	R1	6	R2		R3		R4	

* TUBER SHAPE: *(See figure 10)*

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

V	2-3	R1	2-3	R2		R3		R4	

TUBER THICKNESS:

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

V	1-2	R1	1-2	R2		R3		R4	

TUBER LENGTH (mm):

AVERAGE:

V	91.7	R1		R2		R3		R4	

RANGE:

V	to	R1	to	R2	to	R3	to	R4	to

STANDARD DEVIATION:

V	10.5	R1		R2		R3		R4	

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	150 (1bs)	R1		R2		R3		R4	

TUBER WIDTH (mm):

AVERAGE:

V	68.3	R1		R2		R3		R4	

RANGE:

V	to	R1	to	R2	to	R3	to	R4	to

STANDARD DEVIATION:

V	5.4	R1		R2		R3		R4	

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	150 (1bs)	R1		R2		R3		R4	

TUBER THICKNESS (mm):

AVERAGE:

V	53.3	R1		R2		R3		R4	

RANGE:

V	to	R1	to	R2	to	R3	to	R4	to

STANDARD DEVIATION:

V	4.1	R1		R2		R3		R4	

AVERAGE WEIGHT OF SAMPLE TAKEN:

V	150 (1bs)	R1		R2		R3		R4	

TUBER EYE DEPTH:

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

V	2	R1	2	R2		R3		R4	

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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		R1		R2		R3		R4	

RANGE:

V	to	R1	to	R2	to	R3	to	R4	to

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

V	1	R1	1	R2		R3		R4	

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

V	1	R1	1	R2		R3		R4	

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

JMP PER FAX 12/21/99

V	158 B	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	2	R1	2	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	7			

BACTERIAL RING ROT: Tuber reaction

V	R1	R2	R3	R4
7	7			

LATE BLIGHT

V	R1	R2	R3	R4
0	0			

PLRV (leaf roll)

V	R1	R2	R3	R4
7	7			

PVX

V	R1	R2	R3	R4
0	0			

PVY

V	R1	R2	R3	R4
7	7			

OTHER: Early Blight

V	R1	R2	R3	R4
7	7			

OTHER: PVM

V	R1	R2	R3	R4
7	7			

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
0	0			

OTHER: Colorado Potato Beetle (Leptinotarsa decemtineata)

V	R1	R2	R3	R4
1	7			

8. GENE TRAITS:

INSERTION OF GENES: [X] YES [ ] NO

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

SEE APPENDIX A

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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	4	R1	5	R2		R3		R4	

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

V	8.7-10.7	R1	5.8-14.2	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.

Data of Btt and NPTII expression levels in leaves and tubers available upon further request; Bt can be detected by ELISA. ELISA protocol available upon request.

12. ADDITIONAL COMMENTS AND CHARACTERISTICS:

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

NL Atlantic is not damaged by Colorado Potato Beetle attempting to feed on foliage, in contrast to reference Atlantic variety.

Comprehensive data on
14 location years have been obtained and are available upon request.

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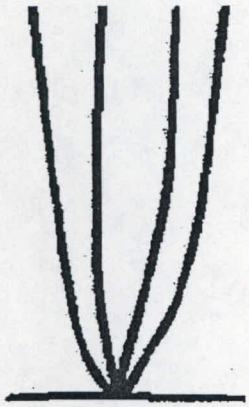
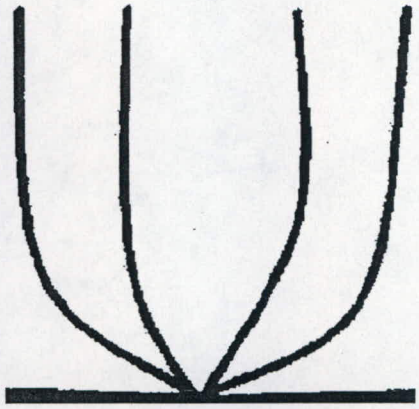
Figure 1: Growth Habit



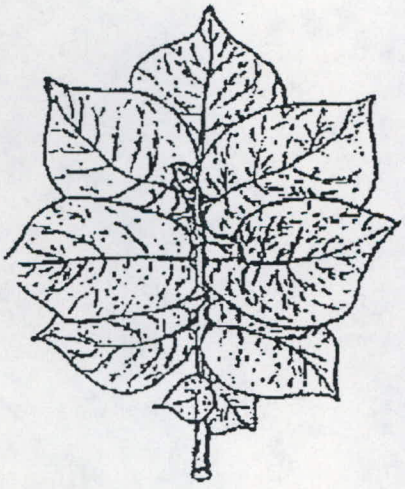
3 = Erect
>45° with ground

5 = Semi-erect
30-45° with ground

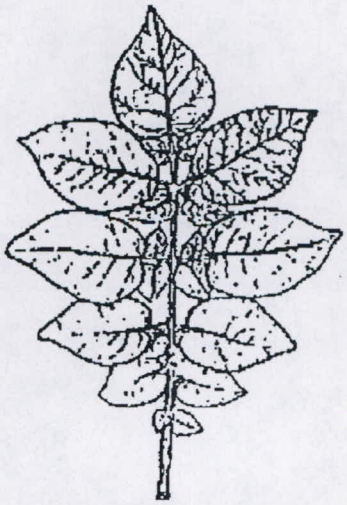


7 = Spreading
<30° with ground

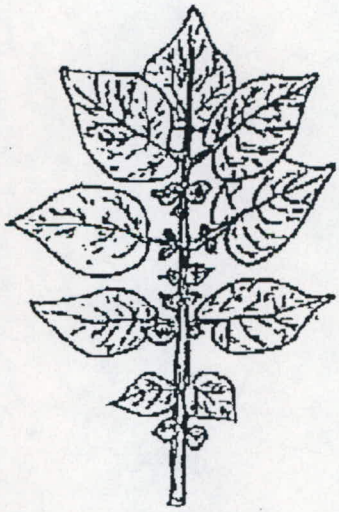
Figure 2: Leaf Silhouette



1 = Closed

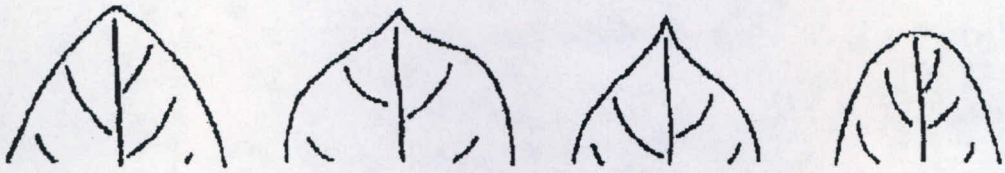


3 = Medium



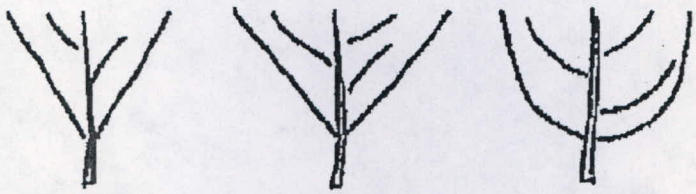
5 = Open

Figure 4: Terminal Leaflet Shape of Tip / Primary Leaflet Shape of Tip



1=Acute 2=Cuspidate 3=Acuminate 4=Obtuse

Figure 5: Terminal Leaflet Shape of Base / Primary Leaflet Shape of Base



1=Cuneate 2=Acute 3=Obtuse

4=Cordate 5=Truncate 6=Lobed

Figure 6: Corolla Shape

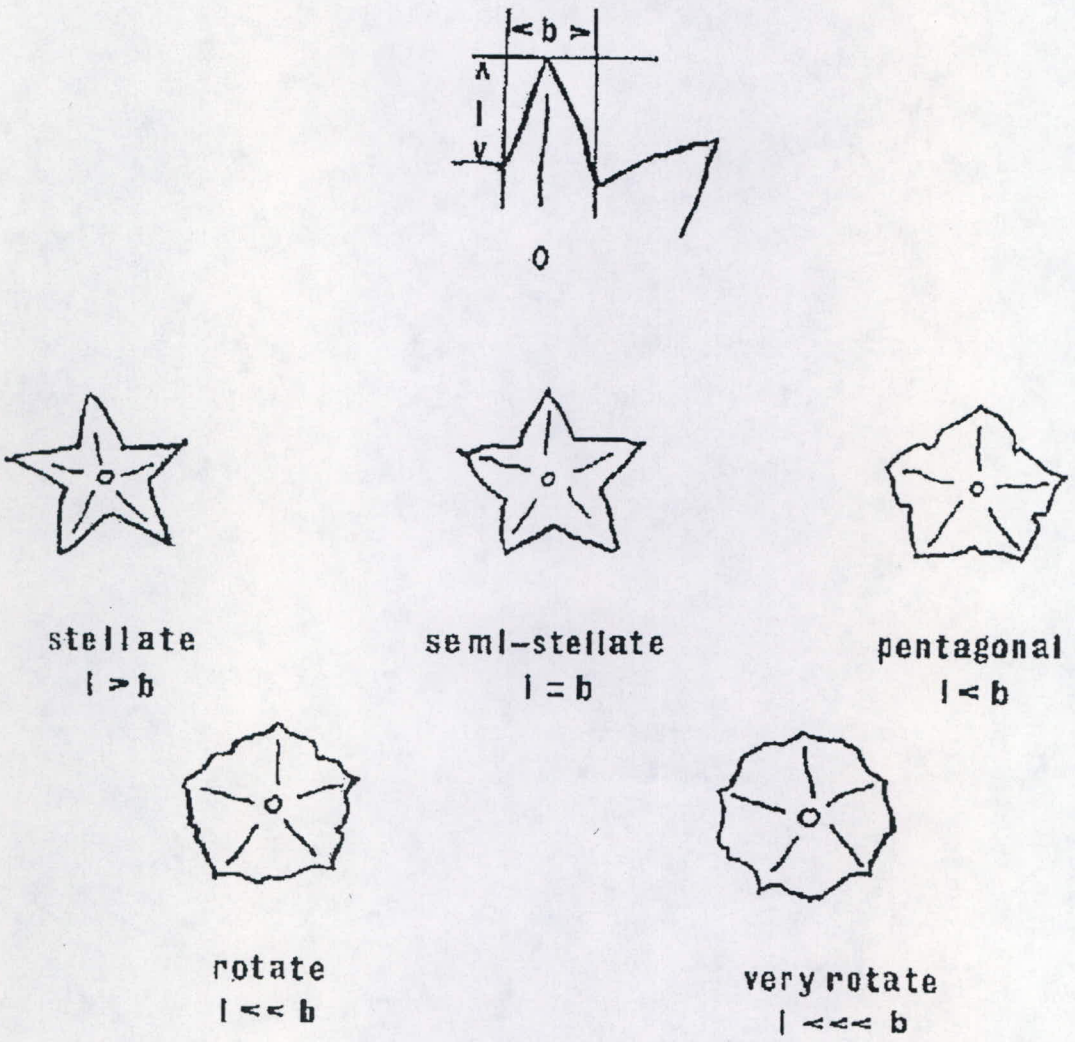


Figure 7: Anther Shape

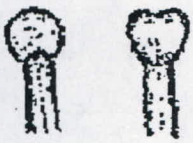
1=Broad cone

2=Narrow cone

3=Pear shape cone

4=Loose

Figure 8: Stigma Shape



1=Capitate

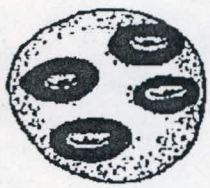
2=Clavate

3=Bilobed

Figure 9: Distribution of Secondary Tuber Color

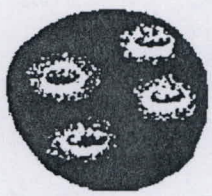
1=Eyes

2=Eyebrows



3=Splashed

4=Scattered



5=Spectacled

6=Stippled

Figure 10: Tuber Shape

1=Compressed 2=Round 3=Oval 4=Oblong 5=Long

Figure 11: Leaf Dissection

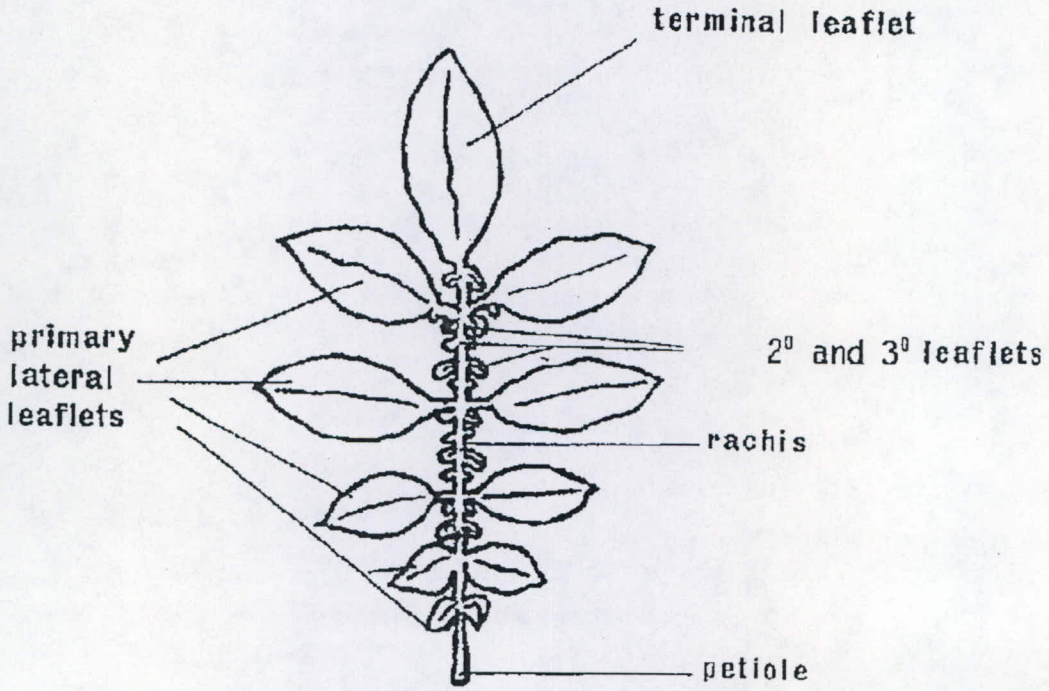
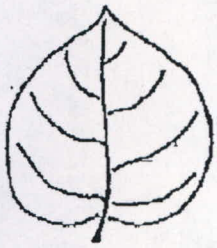


Figure 3: Terminal Leaflet Shape / Primary Leaflet Shape

1=Narrowly Ovate

2=Medium Ovate



3=Broadly Ovate

4=Lanceolate

5=Elliptical

6=Obovate

7=Oblong

Figure: 12 Stem Wings

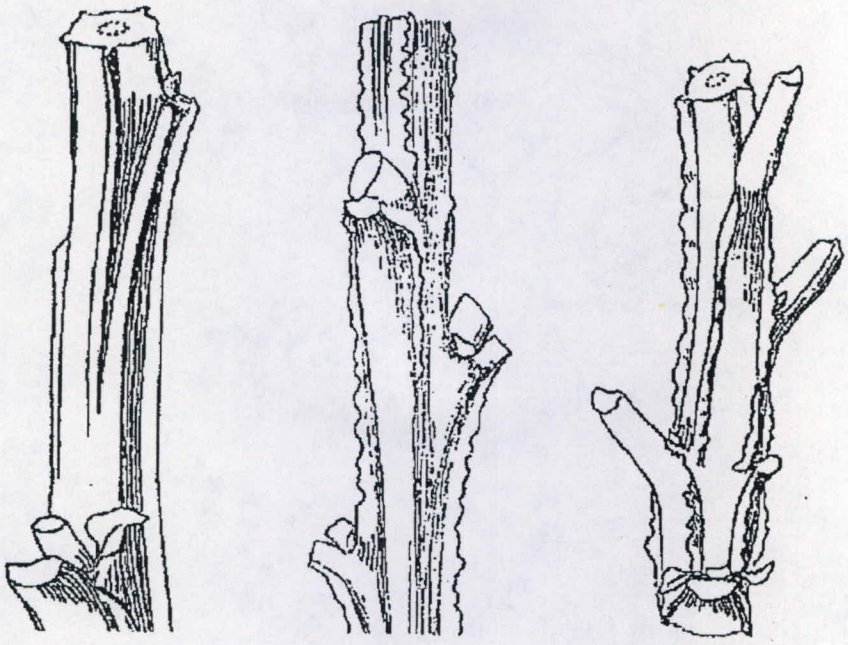
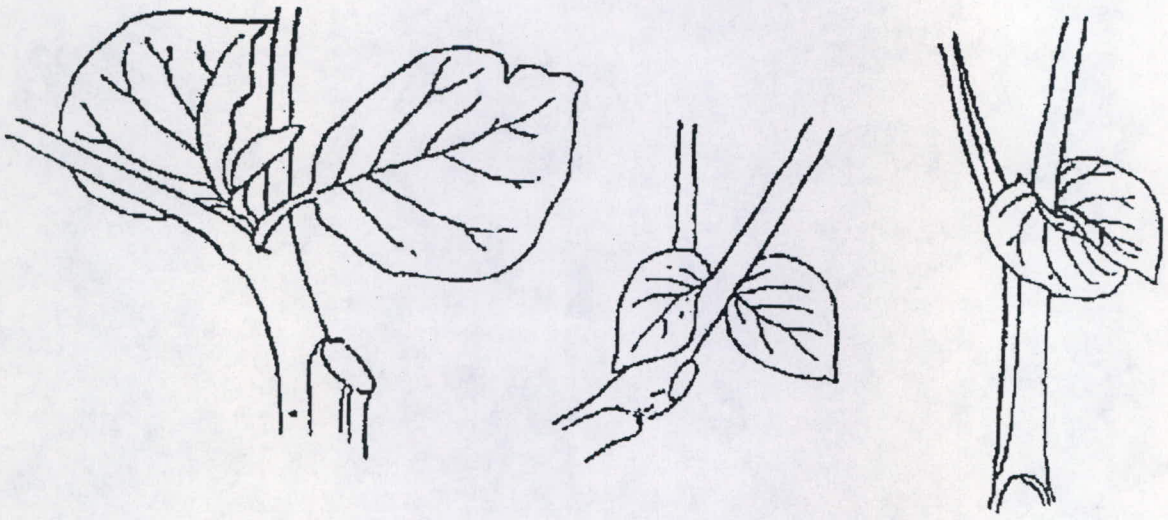


Figure 13: Leaf Stipules:



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APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

~~NL Atlantic~~ NL10-ATL 02/01/01 JMP PER LOTTER

EXHIBIT D

Additional Description of Variety

Statement of Uniformity and Stability:

The potato variety NL Atlantic has been reproduced as seed by Monsanto/NatureMark since 1993 in evaluation trials and for the purpose of seed increase. A total of approximately 52 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, New York and Wisconsin. In that time the variety has produced typical plants and tubers in a very predictable and uniform manner consistent with the Atlantic 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 Atlantic.

Sample of Propagating Material:

Propagating material is maintained by Monsanto/NatureMark at Chesterfield Village Laboratories of Monsanto in St. Louis, MO and at NatureMark's (Monsanto Produce Division) Island Falls Laboratory, Island Falls, ME.

Methods for Maintaining the Variety:

The variety is maintained for vegetative propagation through *in vitro* plant tissue cultures at Island Falls, ME and in Monsanto's Chesterfield Village facilities, St. Louis, MO. *In vitro* microtubers are also maintained at both of these facilities.

9700231

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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 Paper 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)*. The information is held confidential until the certificate is issued *(7 U.S.C. 2426)*.

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Monsanto Company		NL10-ATL
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	(636) 537-6547	(636) 537-7085
	7. PVPO NUMBER	
	9700231	

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

[X] 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

[X] YES [ ] NO

10. Is the applicant the original owner? [X] 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 *(If needed, use the reverse for extra space)*:

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) ot the Plant Variety Protection Act for definitions.

According 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 this information collection is 0581-0055. The time required to complete this information collection is estimated to average 6 minutes 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.

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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 opportunity employer.

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

~~NL Atlantic~~ NL10-ATL 02/01/01 JMP PER LETTER

EXHIBIT E

Statement of the Basis of the Applicant's Ownership

The potato variety NL Atlantic was reproduced by employees of the applicant who were under an obligation to assign inventions or discoveries, including the potato variety Atlantic NL for which application for Plant Variety Protection Certificate is attached.

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APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

~~NL Atlantic~~ NL10-ATL 02/01/01 JMP OCR LETTER

EXHIBIT F

Verification of Future Deposit

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

CUSHMAN DARBY & CUSHMAN
Intellectual Property Group of
PILLSBURY MADISON & SUTRO LLP

By _____
David W. Brinkman
Tel: (202) 861-3033

1100 New York Avenue, N.W.
Ninth Floor, East Tower
Washington, D. C. 20005-3918

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