No.



## TO ALL TO WHOM THESE PRESENTS SHALL COME:

# Syngenta Seeds, Inc.

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 pagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different to therefrom, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS DED, 7 U.S.C. 2321 ET SEQ.)

## LETTUCE

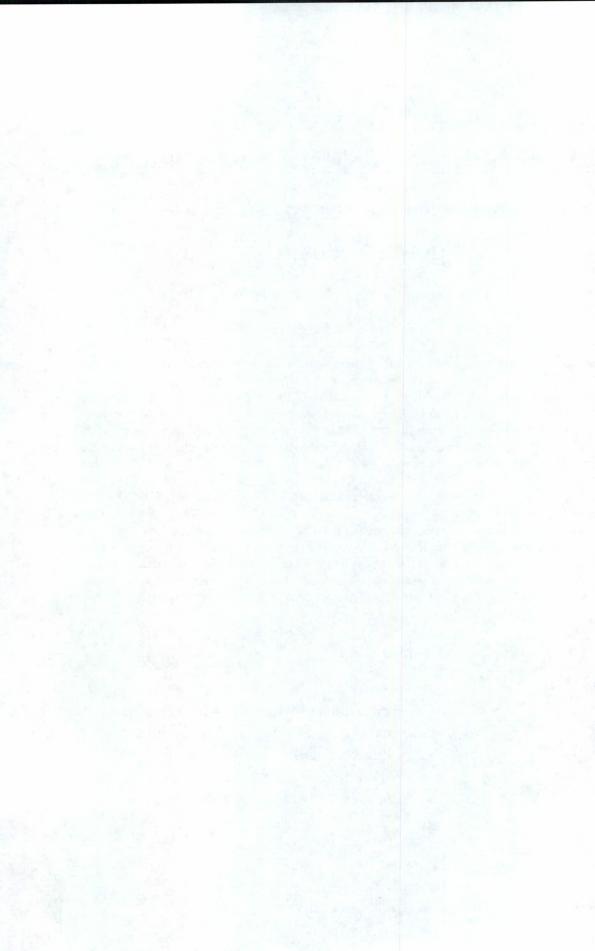
## 'Musena'

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 August, in the year two thousand and nine.

Attest:

Commissioner Plant Variety Protection Office Agricultural Marketing Service

ry of Agriculture



REPRODUCE LOCALLY. Include form number and da	ate on all reproductions	Form Approved - OMB No. 0581-0055				
U.S. DEPARTMENT O AGRICULTURAL MARI SCIENCE AND TECHNOLOGY - PLANT	KETING SERVICE	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 FOR PLANT VARIET (Instructions and information collection		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 OWNER		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME		3. VARIETY NAME		
Syngenta Seeds, Inc.		LS485	53	Musena		
4. ADDRESS (Street and No., or R.F.D. No., City,	State, and ZIP Code, and Country)	5. TELEPHON	NE (include area code)	FOR OFFICIAL USE ONLY		
6338 Highway 20-26; Nampa, ID 83687		208-46	5-8522	#200800281		
		6. FAX (includ	le area code)			
and the second		208-46	7-4559	FILING DATE		
7. IF THE OWNER NAMED IS NOT A "PERSON", FORM OF ORGANIZATION (corporation, partnershi		9. DATE OF I	NCORPORATION			
association, etc.) Corporation	02/25/1975	Delay	ware	June 4, 2008		
10. NAME AND ADDRESS OF OWNER REPRESE Kim Briggs c/o Syngenta Seed		TION. (First persor	n listed will receive all papers)	F FILING AND EXAMINATION FEES: 4,387		
				$\begin{array}{c} R \\ E \\ C \\ C \\ C \\ T \\ C \\ C \\ C \\ C \\ C \\ C$		
11. TELEPHONE (Include area code) 208-465-8522	12. FAX (Include area code) 208-467-4559		13. E-MAIL kim.briggs@syngenta.com			
14. CROP KIND (Common Name)	16. FAMILY NAME (Botanical)		18. DOES THE VARIETY CONTAIN ANY TR			
Lettuce	Compositae		YES 🗸 NO			
15. GENUS AND SPECIES NAME OF CROP	17. IS THE VARIETY A FIRST GENERAT	TION HYBRID?	IF SO, PLEASE GIVE THE ASSIGNED USD APPROVED PETITION TO DEREGULATE T			
_actuca sativa	YES VNO		COMMERCIALIZATION.			
that tissue culture will be deposited an	riety e Variety (Optional) ne Owner's Ownership osit ed seeds or, for tuber propagated varieties, w d maintained in an approved public repositor, made payable to "Treasurer of the United ction Office) STED MATERIAL) OR A HYBRID PRODUC STED MATERIAL) OR A HYBRID PRODUC D OF, TRANSFERRED, OR USED IN THE U	ed J. S. OR DR USE	22. DOES THE OWNER SPECIFY THAT SE NUMBER OF GENERATIONS? YES NO IF YES, SPECIFY THE NUMBER 1,2,3, 6 FOUNDATION REGISTERED (If additional explanation is necessary, plu 24. IS THE VARIETY OR ANY COMPONEN INTELLECTUAL PROPERTY RIGHT (PL	and 22 below)         EED OF THIS VARIETY BE LIMITED AS TO         IDATION       REGISTERED         CERTIFIED         ED OF THIS VARIETY BE LIMITED AS TO         etc.       FOR EACH CLASS.         CERTIFIED         ease use the space indicated on the reverse.)         T OF THE VARIETY PROTECTED BY         ANT BREEDER'S RIGHT OR PATENTJ?         E OF FILING OR ISSUANCE AND ASSIGNED		
25. The owners declare that a viable sample of bas for a tuber propagated variety a tissue culture. The undersigned owner(s) is(are) the owner of entitled to protection under the provisions of Section Owner(s) is (are) informed that false representation.	will be deposited in a public repository and n this sexually reproduced or tuber propagated 42 of the Plant Variety Protection Act.	naintained for the o	duration of the certificate.	with such regulations as may be applicable, or m, and stable as required in Section 42, and is		
SIGNATURE OF OWNER	s services and populate protocion and to		TURE OF OWNER			
NAME (Piedse print or type)			(Please print or type)			
Kim Briggs	1		* buur er (bed)			
PVP Specialist	June 2, 2008	CAPAC	CITY OR TITLE DATE			
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(See reverse for instructions and information collection burden statement)

**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. <u>Retain one copy for your files</u>. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed 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.)

# Domestic FDS: June 13, 2007; Foreign FDS: England, February 1, 2007

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).)

# EU Community - Natl. List - NL16196; Netherlands NL - 29893; EU Community - PVR - 2006/0394

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).

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# LETTUCE

# Musena (LS4853)

# **EXHIBIT** A

# **ORIGIN AND BREEDING HISTORY**

The objective in the development of Syngenta Seeds lettuce variety Musena was to breed a dark green romaine variety with bolting tolerance and downy mildew resistance.

Female		Male	
Terlana	x	Chi	quina (SG) <b>2000</b>
	F1	2000	
	F2	2001	93 single plant selections
	F3	2002	3 single plant selections
	F4	2003	2 single plant selections
	LS4853 F5	2004	5 single plant selections
	F6	2005	20 single plant selections and seed increase
	F7	2006	Trials and seed increase

Musena is derived from a 2000 cross between Terlana and Chiquina. Chiquina provides resistance to CA pathotypes IIa, IIb, III, V, VI, VII and VIII. Musena also carries resistance to these pathotypes.

F2 seed was planted in 2001 and the seedlings were inoculated with lettuce Downy mildew. Resistant plants were selected for advancement to the F3.

F3 seed was collected from individual F2 plants in 2002. Each F3 was sown and inoculated with lettuce Downy mildew. Only F3 lines homozygous for resistance were continued. Selections in F3 were done in the most uniform lines for dark color, romaine leaf shape and thick leaf texture.

The most uniform F5 was named LS4853 in 2004. Observation of the F6 in 2005 was favorable and the line was named Musena.

Musena has been observed through 3 generations (F5, F6, F7) of reproduction and was found to be uniform and stable. No variants have been observed.

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The breeding method employed was pedigree selection, using single plant selection and mass selection practices.

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# LETTUCE

# MUSENA (LS4853)

# EXHIBIT B

# NOVELTY STATEMENT

Musena is most similar to Paragon PIC, however Musena is distinctly different because it is highly resistant to downy mildew (<u>Bremia lactucae</u>) whereas Paragon PIC is susceptible. Also, Musena has a significantly narrower core than Paragon PIC.

1. Tests of Musena and Paragon PIC to <u>Bremia lactucae</u> conducted at U.C. Davis in October 2006 and November 2007 showed Musena to have a high level of resistance to CA pathotypes IIa, IIb, III, V, VI, VII and VIII and Paragon PIC to be susceptible to these pathotypes. An additional test in February 2009 showed Musena to be resistant to CA pathotypes VII and VIII and Paragon PIC to be susceptible to these pathotypes. These results are summarized in Table 1.

2. In two trials Musena has shown to have a significantly narrower core than Paragon PIC. In a Gilroy, CA trial in May, 2007 Musena had a mean value of 3.7 cm (CL (95) = 3.7 +/- 0.12 cm) and Paragon PIC had a value of 4.21 cm (CL(95) = 4.21 +/- 0.20 cm). In a second Gilroy trial in July, 2007 Musena had a mean value of 3.51 cm (CL (95) = 3.51 +/- 0.14 cm) while Paragon PIC had a value of 4.12 cm (CL (95) = 4.12 +/- 0.21 cm).

Note: Musena was shown to be resistant to CA pathotypes VII and VIII of downy mildew and Dark Green Cos was susceptible (Table 1). Therefore these two varieties are distinct from one another.

3/9/09 Amendment: The leaf surface of Musena is very glossy whereas that of Paragon PIC is dull and Musena has strong blistering whereas Paragon PIC has slight blistering.

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

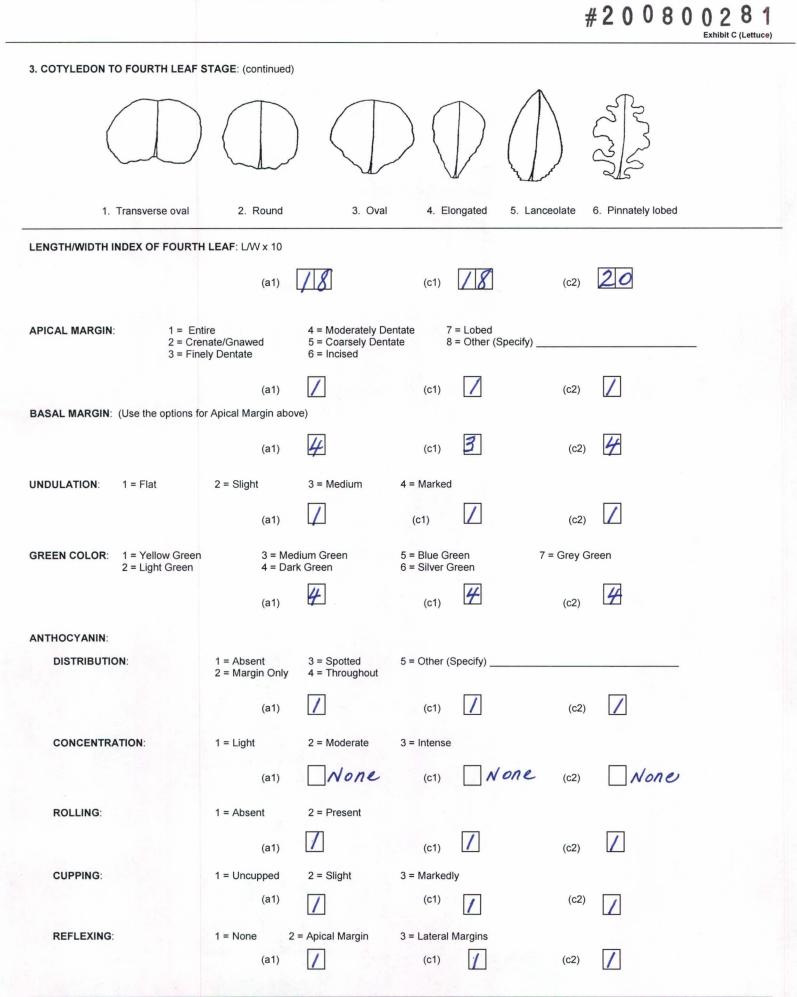
Form Approved OMB NO 0581-0055 According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 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.

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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 C
OBJECTIVE DESCRIPTION OF VARIETY Lettuce (Lactuca sativa L.)	
NAME OF APPLICANT (S) Syngenta Seeds, Thc. LS4853	VARIETY NAME MUSENA
ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country) 6338 Highway 20-26 Nampa, ID 83687	FOR OFFICIAL USE ONLY PVPO NUMBER # 2 0 0 8 0 0 2 8 1
Place the appropriate number that describes the varietal character in the boxes below. Place a zero in the first box is either 99 or less or 9 or less. Measured data should be the mean of an appropriate number (at least 20) of well sp recognized color standard may be used to determine plant colors.	
The Location of the Test Area is: Gilroy, CA Color System Used: RHS	
SPECIFIC VARIETIES USED FOR COMPARISON AS CHECK VARIETIES IN THIS APPLICATION: Use standard your area. One of the comparison varieties must be the most similar variety used in Exhibit B.  Application Variety (a1)MUSERAMost Similar Variety (c1)PI  Standard Regional Check Variety (c2)Green Jorest	regional check varieties, which are adapted to
1. PLANT TYPE: (See List of Suggested Check Varieties on Page 8)         01 = Cutting/Leaf       04 = Cos or Romaine       07 = Salinas Group       10 = Latin         02 = Butterhead       05 = Great Lakes Group       08 = Eastern (Ithaca) Group       11 = Other (Sp         03 = Bibb       04 = Cos or Romaine       07 = Salinas Group       10 = Latin         04 = Cos or Romaine       07 = Salinas Group       10 = Latin         05 = Great Lakes Group       09 = Stem       11 = Other (Sp         06 = Vanguard Group       09 = Stem       02 = 0 4         (a1)       04       (c1)       04	2 9 2009
2. SEED: (a1) $\overrightarrow{I}$ (c1) $\overrightarrow{I}$ (c2) $\overrightarrow{I}$ (c2) $\overrightarrow{I}$ (a1) $\overrightarrow{I}$ (a2) $\overrightarrow{I}$ (a2) $\overrightarrow{I}$ (a3) $\overrightarrow{I}$ (a1) $\overrightarrow{I}$ (a1) $\overrightarrow{I}$ (a2) $\overrightarrow{I}$ (a2) $\overrightarrow{I}$ (a3) $\overrightarrow{I}$ (a3) $\overrightarrow{I}$ (a4) $\overrightarrow{I}$ (a4) $\overrightarrow{I}$ (a5) $\overrightarrow{I}$ (a5) $\overrightarrow{I}$ (a7) $\overrightarrow{I}$ (a7) $\overrightarrow{I}$ (a8) $\overrightarrow{I}$ (a8) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a1) $\overrightarrow{I}$ (a1) $\overrightarrow{I}$ (a2) $\overrightarrow{I}$ (a2) $\overrightarrow{I}$ (a3) $\overrightarrow{I}$ (a4) $\overrightarrow{I}$ (a5) $\overrightarrow{I}$ (a5) $\overrightarrow{I}$ (a7) $\overrightarrow{I}$ (a7) $\overrightarrow{I}$ (a8) $\overrightarrow{I}$ (a8) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a9) $\overrightarrow{I}$ (a1) $\overrightarrow{I}$ (a2) $\overrightarrow{I}$ (a2) $\overrightarrow{I}$ (a3) $\overrightarrow{I}$ (a3) $\overrightarrow{I}$ (a4) $\overrightarrow{I}$ (a5) $\overrightarrow{I}$ (a5) $\overrightarrow{I}$ (a5) $\overrightarrow{I}$ (a5) $\overrightarrow{I}$ (a7) (a7) (a7) (a7) (a7) (a7) (a7) (a7)	HEAT DORMANCY 1 = Susceptible 2 = Not Susceptible
3. COTYLEDON TO FOURTH LEAF STAGE: NOTE: Provide a color photograph or photocopy of the fourth leaf fro conditions.	om 20 day-old seedling grown under optimal
SHAPE OF COTYLEDONS: 1 = Broad 2 = Intermediate 3 = Spatulate (a1) 2 (c1) 2 (c2)	2
SHAPE OF FOURTH LEAF: (a1) 4 (c1) 4 (c2)	4
ST-470-1 (04-03) designed by the Plant Variety Protection Office using Microsoft Word 2000.	Page 1 of 9

# #20080028 2008 JUN 4 PH 1:29



ST-470-1 (04-05) designed by the Plant Variety Protection Office using Microsoft Word 2003.

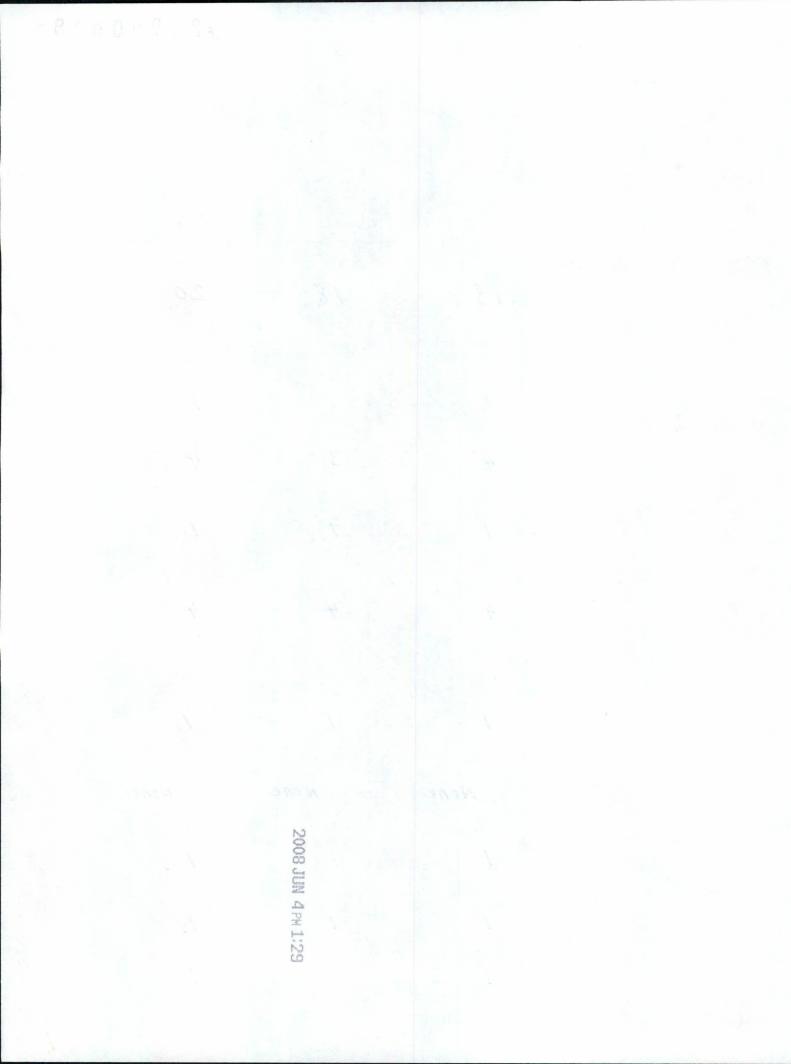


Exhibit C (Lettuce)

4. MATURE LEAVES (Observe Harvest-Mature Outer Leaves)

NOTE: Provide color photo of a harvest-mature leaf which accurately shows color and margin characteristics.

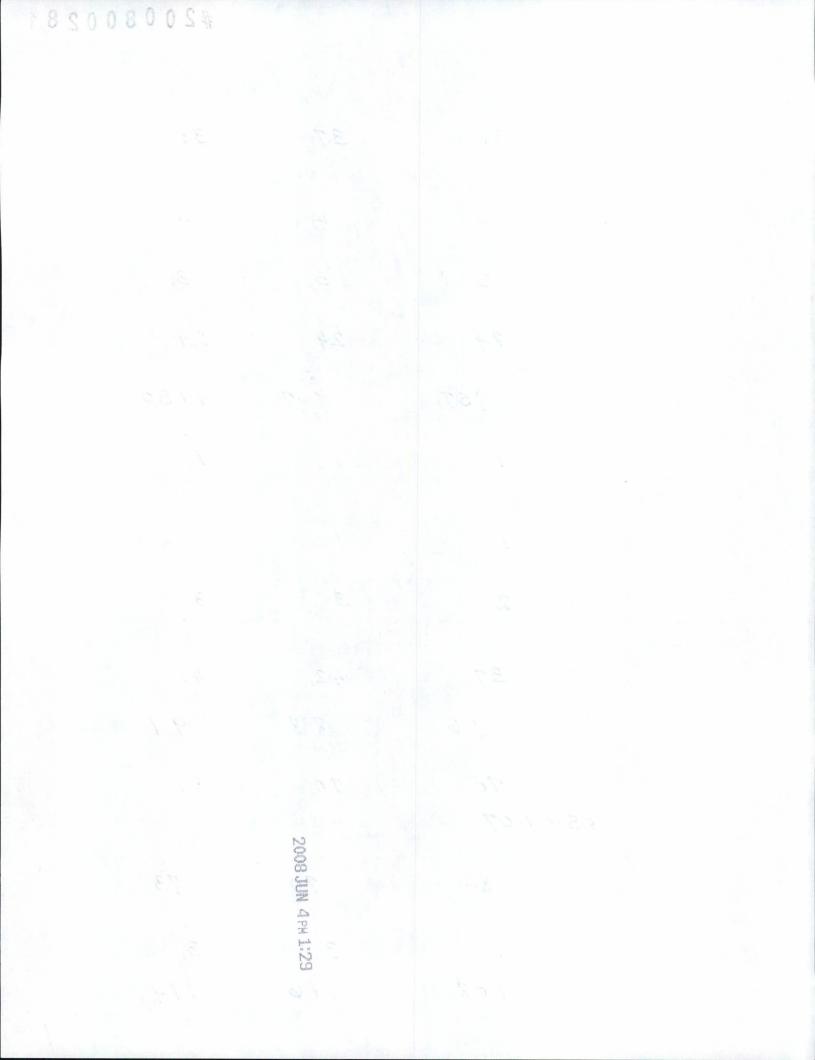
MARGIN:				
INCISION DEPTH: 1 (deepest penetration of the margin)	= Absent/Shallow (Dark	Green Boston)	2 = Moderate (Vanguard)	3 = Deep (Great Lakes 659)
or the margin)	(a1)		(c1)	(c2)
INDENTATION: (Finest div	sions of the margin)			
	1 = Entire (Dark Gree 2 = Shallowly Dentat 3 = Deeply Dentate (	e (Great Lakes 65)	4 = Crenate (Vanguard) 5 = Other (Specify)	ery shallow
	(a1)	5	(c1) 5	(c2) <b>5</b>
UNDULATIONS OF THE APICAL MARGIN:	1 = Absent/Slight (Da 3 = Strong (Great La	rk Green Boston) 2 kes 659)	e = Moderate (Vanguard)	
	(a1)	/	(c1)	(c2)
GREEN COLOR:	1 = Very Light Green 2 = Light Green (Min	etto) 4 = Dark (		· Very Dark Green · Other (Specify)
	(a1)	3	(c1) <b>4</b>	(c2) <b>5</b>
DISTRIBUTION:	1 = Absent 2 = Margin Only (Big		ted (California Cream Butter) ughout (Prize Head)	5 = Other (Specify)
	(a1)	/	(c1)	(c2)
CONCENTRATION:	1 = Light (Iceberg) (a1)	2 = Modera	(c1) 3 = Intense	
SIZE:	1 = Small (a1)	2= Medium	(c1) 3 = Large	(c2)
GLOSSINESS:	1 = Dull (Vanguard) (a1)	2 = Moder	cate (Salinas) 3 = Gl	(c2)
	sent/Slight alinas) (a1)	2 = Moderate (Vanguard)	3 = Strong (Prize Head) (c1)	(c2)
LEAF THICKNESS: 1	= Thin (a1)	2 = Intermediate	3 = Thick (c1)	(c2) <b>2</b>
TRICHOMES: 1 = Ab	sent (Smooth)	2 = Present (Spiny)	(c1)	(c2)
LANT:				
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ST-470-1 (04-05) designed by the Plant Variety Protection Office using Microsoft Word 2003.

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						#2008	0 0 2 8 1 Exhibit C (Lettuce)
5. PLANT: (continued)							
HEAD DIAMETER: (Market Trimmed	d with Single Cap Le	eaf)					
	(a1)	36 cm	(c1)	37 cm	(c2)	<u>38</u> cm	
HEAD SHAPE:	1 = Flattened 2 = Slightly Flatt	3 = Spheri ened 4 = Elonga		5 = Non-Heading			
6 = Other (Specify)	(a1)	4	(c1)	4	(c2)	4	
HEAD SIZE CLASS:	1 = Small	2 = Mediu	m	3= Large			
	(a1)	3	(c1)	3	(c2)	3	
HEAD PER CARTON:							
	(a1)	24	(c1)	24	(c2)	24	
HEAD WEIGHT:							
	(a1)	957	g. (c1)	947	g. (c2)	1150 g.	
HEAD FIRMNESS:	1 = Loose	2 = Moderate		3= Firm	2	4 = Very Firm	
	(a1)	1	(c1)		(c2)	/	
6. BUTT:							
SHAPE:	1 = Slightly Con	cave 2 = F		3 = Rounded			
	(a1)		(c1)		(c2)		
MIDRIB:	1 = Flattened (S	alinas) 2 = N	loderately Raise		nently Rais	ed (Great Lakes 659)	
	(a1)	2	(c1)	3	(c2)	3	
7. CORE:							
DIAMETER AT BASE OF HEAD	D: (a1)	37 mm	(c1)	42 mm	(c2)	4 / mm	
RATIO OF HEAD DIAMETER/C	ORE DIAMETER:						
	(a1)	9.6	(c1)	8.8	(c2)	9.1	
CORE HEIGHT FROM BASE O	F HEAD TO APEX					_	
	(a1)	70 mm	(c1)	70 mm	(c2)	8 1 mm	
8. BOLTING: (Give First Water Date	05-09-	07) NOTE: F	irst Water Date can and often d	is the date seed firs oes equal the planti	t receives a ng date.	adequate moisture to g	erminate. This
NUMBER OF DAYS FROM FIRST	WATER DATE TO	SEED STALK EME	ERGENCE: (sur	nmer conditions)			
	(a1)	84	(c1)	10	(c2)	73	
BOLTING CLASS:	1 = Very Slow 2 = Slow	3 = Medium 4 = Rapid	5 = Very R	apid			
	(a1)	2	(c1)	3	(c2)	3	
HEIGHT OF MATURE SEED STA	LK:	108		116		114	
ST-470-1 (04-05) designed by the Plant Variety	Protection Office using	Microsoft Word 2003.					Page 4 of 9



						7	<b>#20</b> 080	0281 Exhibit C (Lettuce)
	(a1)	cm	(c1)		cm	(c2)	cm	
8. BOLTING: (continued)								
SPREAD OF BOLTER PLANT: (At wide	st point)							
	(a1)	cm	(c1)	55 cm		(c2)	<b>53</b> cm	
BOLTER LEAVES: 1 = Straight	2 = Curved							
	(a1)		(c1)	1		(c2)		
MARGIN: 1 = Entire 2 = Dentate								
	(a1)		(c1)	/		(c2)	/	
COLOR: 1 = Light Green 2 =	= Medium Green 3 =	Dark Green						
	(a1)		(c1)	3		(c2)	3	
BOLTER HABIT:								
TERMINAL INFLORESCENCE: 1 =	= Absent 2 =	Present						
	(a1)		(c1)	2		(c2)	2	
LATERAL SHOOTS:	1 = Absent	2 = Present						
	(a1)	2 - 1103011	(c1)	/		(c2)		
BASAL SIDE SHOOTS:	1 = Absent	2 = Present						
BASKE SIDE SHOOTS.	(a1)	2 - 1163611	(c1)	/		(c2)		

9. MATURITY: (earliness of harvest-mature head formation)

NOTE: Complete this section for at least one season.

SEASON	APPLICATION VAR No. of Days <sup>1</sup>	RIETY MOST SIMILAR V No. of Days		IONAL CHECK VARIETY No. of Days <sup>1</sup>
Spring	83	80	80	
Summer	72	72	67	
Fall				
Winter				

<sup>1</sup> First Water Date to Harvest

Give Planting Date(s) and Location(s):

S		

03-22-2007 Gilroy, CA 05-26-2007 Gilroy, CA Summer:

Eal	11 ·

Winter:

# 10. ADAPTATION:

PRIMARY REGIONS OF ADAPTATION (tested and proven adapted):

0 = Not Tested	1 = Not Adapted	2 = Adapted	

	Southwest (CA and/or AZ desert)	2	West Coast	0	Northeast
0	North Central	0	Southeast		Other (Specify)

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# # 2 0 0 8 0 0 2.8 1 (Lettuce)

10. A	DAPTATION: (Continued)				
SEAS	ON:				
	Spring (Area	) [F	all (Area		)
	Spring (Area Summer (Area	oast n	vinter (Area		)
1	GREENHOUSE: 0 = Not Test	ted 1 = Not Adapted	2 = Adapted		
	SOIL TYPE: 1 = Mineral		3 = Both		
			0 - 200		
11. V	IRAL DISEASES:				
1	I = Immune 3 = Resistant 5	= Moderately Resistant/Moder	rately Susceptible 7 = S	Susceptible 9:	= Highly Susceptible
E	Big Vein	(a1)	(c1)	(c2)	
ι	_ettuce Mosaic	(a1)	(c1)	(c2)	
(	Cucumber Mosaic	(a1)	(c1)	(c2)	
1	Tomato Bushy Stunt, cause of dieback	(a1)	(c1)	(c2)	
1	Turnip Mosaic	(a1)	(c1)	(c2)	
E	Beet Western Yellows	(a1)	(c1)	(c2)	
L	_ettuce Infectious Yellows	(a1)	(c1)	(c2)	
C	Other (Specify)	(a1)	(c1)	(c2)	
12. F	UNGAL/BACTERIAL DISEASES:				
1	I = Immune 3 = Resistant 5	= Moderately Resistant/Moder	rately Susceptible 7 = S	Susceptible 9	= Highly Susceptible
	Corky Root Rot	(a1)	(c1)	(c2)	
(	Races:				
	Powny Mildew Ta, Tb, TL, T,	(a1) <b>3</b>	(c1) <b>7</b>	(c2)	
	Powdery Mildew	(a1)	(c1)	(c2)	
	Sclerotinia Drop	(a1)	(c1)	(c2)	
	Bacterial Soft Rot	(a1)	(c1)	(c2)	
	(Pseudomonas spp. and others)				
E	Botrytis (Grey Mold)	(a1)	(c1)	(c2)	
1	Verticillium Wilt	(a1)	(c1)	(c2)	
E	Bacterial Leaf Spot	(a1)	(c1)	(c2)	
/	Anthracnose	(a1)	(c1)	(c2)	
(	Other (Specify)	(a1)	(c1)	(c2)	
13. 1	NSECTS:				
		= Moderately Resistant/Moder	rately Susceptible 7 = S	Susceptible 9	= Highly Susceptible
(	Cabbage Loopers	(a1)	(c1)	(c2)	
	Root Aphids	(a1)	(c1)	(c2)	
	Green Peach Aphid	(a1)	(c1)	(c2)	
	Lettuce Aphid	(a1)	(c1)	(c2)	
	Lottedo / Iprile	(	(	()	

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Exhibit C (Lettuce)

	Pea Leafminer	(a1)	(c1)	(c2)	
	Other (Specify)	(a1)	(c1)	(c2)	
14.	PHYSIOLOGICAL STRESSES:				
	1 = Immune 3 = Resistant	5 = Moderately Resistan	t/Moderately Susceptible	7 = Susceptible 9 = Highly Susceptible	
	Tipburn	(a1)	(c1)	(c2)	
	Heat	(a1)	(c1)	(c2)	
	Drought	(a1)	(c1)	(c2)	
	Cold	(a1)	(c1)	(c2)	
	Salt	(a1)	(c1)	(c2)	
	Brown Rib (Rib Discoloration, Rib Blight)	(a1)	(c1)	(c2)	
	Other (Specify)	(a1)	(c1)	(c2)	
5.	POST HARVEST STRESS:				
	1 = Immune 3 = Resistant	5 = Moderately Resistan	t/Moderately Susceptible	7 = Susceptible 9 = Highly Susceptible	
	Pink Rib	(a1)	(c1)	(c2)	
	Russet Spotting	(a1)	(c1)	(c2)	
	Rusty Brown Discoloration	(a1)	(c1)	(c2)	
	Internal Rib Necrosis (Blackheart, Grey Rib, Grey Streak)	(a1)	(c1)	(c2)	
	Brown Stain	(a1)	(c1)	(c2)	

16. BIOCHEMICAL OR ELECTROPHORETIC MARKERS:

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17. COMMENTS:

## SUGGESTED CHECK VARIETIES

TYPE Cutting/Leaf 1 2 Butterhead 3 Bibb 4 Cos or Romain 5 Great Lakes Group 6 Vanguard Group 7 Salinas Group 8 Eastern Group 9 Stem 10 Latin

CHECK VARIETY Waldmann's Green Dark Green Boston Bibb Parris Island Great Lakes 659-700 Vanguard Salinas Ithaca Celtuce Little Gem

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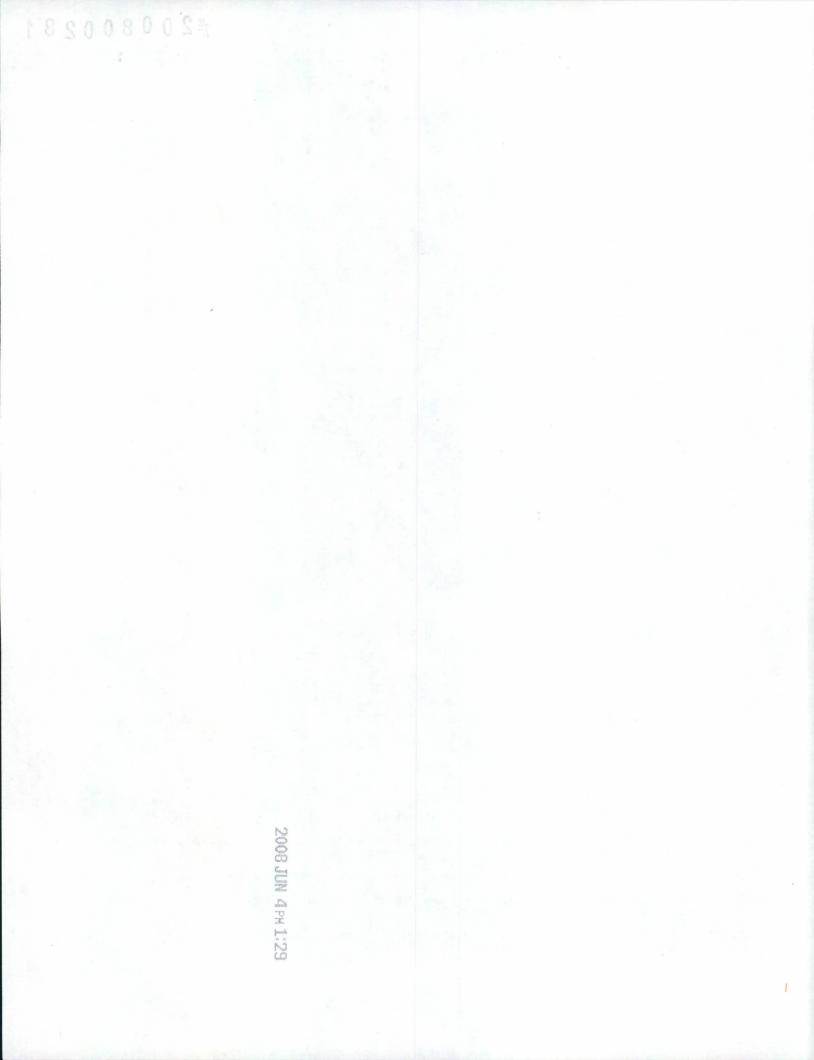
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Musena -





Musena

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Table 1. Reaction of 'Musena', 'PIC' and 'Dark Green Cos' to Various CA Pathotypes of Downy Mildew

			and the second	D	owny Mildev	v Isolates		
Date	Variety	IIA	IIB		V	VI	VII	VIII
10/06	Musena	ns	ns	ns	ns	ns	ns	ns
11/07	PIC	S	S	S	S	S	S	S
2/09	Musena						ns/1 necrotic	ns/ 1 necroti
	PIC		512-61				S	S
	Dark Green Cos			2-			S	S

ns = no sporulation s = sporulation

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REPRODUCE LOCALLY. Include form number and edition date on al	I reproductions. F	ORM APPROVED - OMB No. 0581-0055
U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE EXHIBIT E	Application is required in order to detection certificate is to be issued (7 U.S.C. 24 confidential until the certificate is issued to the certificate is is is t	421). The information is held
STATEMENT OF THE BASIS OF OWNERSHIP		dd (7 0.0.0. 2720).
1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Syngenta Seeds, Inc.	LS4853	Musena
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)
6338 Highway 20-26	(208) 465-8522	(208) 467-4559
Nampa, ID 83687	7. PVPO NUMBER	
	#200800	281
8. Does the applicant own all rights to the variety? Mark an "X" in the	ne appropriate block. If no, please expla	in. 🗸 YES 🗖 NO
9. Is the applicant (individual or company) a U.S. national or a U.S.	based company? If no, give name of c	ountry. 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. Nation NO If no, give name of count	
<ul> <li>b. If the original rights to variety were owned by a company(ies YES</li> <li>11. Additional explanation on ownership (<i>Trace ownership from orig</i>)</li> </ul>	NO If no, give name of count	ry
Musena was bred and developed by plant breeders employed by Seeds, Inc., all rights to any invention, discovery or developmen assigned to Syngenta Seeds, Inc., with no rights retained by the	t made by the employee while employe	ween the employee and Syngenta d by Syngenta Seeds, Inc. were
PLEASE NOTE:		
Plant variety protection can only be afforded to the owners (not licer	nsees) who meet the following criteria:	
<ol> <li>If the rights to the variety are owned by the original breeder, that national of a country which affords similar protection to nationals</li> </ol>		
<ol><li>If the rights to the variety are owned by the company which employnationals of a UPOV member country, or owned by nationals of a genus and species.</li></ol>	oyed the original breeder(s), the compan country which affords similar protection	y must be U.S. based, owned by to nationals of the U.S. for the same
3. If the applicant is an owner who is not the original owner, both the	e original owner and the applicant must r	neet one of the above criteria.
The original breeder/owner may be the individual or company who on Act for definitions.	directed the final breeding. See Section	41(a)(2) of the Plant Variety Protection
According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponso control number. The valid OMB control number for this information collection is 0581-005: including the time for reviewing the instructions, searching existing data sources, gathering	<ol><li>The time required to complete this information college</li></ol>	ection is estimated to average 0.1 hour per response,
The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and marital or family status, political beliefs, parental status, or protected genetic information communication of program information (Braille, large print, audiotape, etc.) should contact	(Not all prohibited bases apply to all programs.) Perso	ons with disabilities who require alternative means for
To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 320 720-5964 (voice and TDD). USDA is an equal opportunity provide and employer.		e, SW, Washington, D.C. 20250-9410 or call (202)
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	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 Seeds, Inc.	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) 6338 Highway 20-26 Nampa, Idaho 83687	TEMPORARY OR EXPERIMENTAL DESIGNATION LS4853 VARIETY NAME MUSCHA
NAME OF OWNER REPRESENTATIVE (S) Kim Briggs	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) 6338 Highway 20-26 Nampa, ID 83687	FOR OFFICIAL USE ONLY PVPO NUMBER # 2 0 0 8 0 0 2 8 1

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.

6-2-08 Date

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