

No.

202100493

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Stephanie Franck

Whereas, THERE HAS BEEN PRESENTED TO THE

Administrator of the Agricultural Marketing Service

An application requesting a certificate of protection for an alleged novel variety of sexually reproduced, asexually 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 germplasm material of the variety in a public repository as provided by law, the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or conditioning it for propagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different variety there from, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)



WHEAT

'Milestone'

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 twenty seventh day of May, in the year two thousand twenty two.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Administrator
Agricultural Marketing Service

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

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

*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).
OMB Collection #0581-0055*

FOR OFFICIAL USE ONLY:	
PVPO NUMBER: 202100493	FILING DATE: 9/11/2021
FILING AND EXAMINATION FEES PAID \$5,150 9/13/2021	
1. NAME OF OWNER: (Name to be printed on certificate) Stephanie Franck	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME: ACS14132-412
	3. VARIETY NAME: Milestone
4. ADDRESS: PZO-Pflanzenzucht Oberlimpurg Oberlimpurg 2 D 74523 Schwabisch Hall Germany	
5. OWNER TELEPHONE: (+00 (000) 000-0000) 011-49-791-93118-0	6. OWNER FAX NUMBER AND/OR EMAIL ADDRESS: 011-49-791-93118-99
7. IF OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION: (<i>corporation, partnership, association. etc.</i>)	
8. IF INCORPORATED, GIVE STATE OF INCORPORATION:	9. DATE OF INCORPORATION:
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) AND/OR BREEDERS(S) TO SERVE ON THIS APPLICATION: (<i>First person listed will receive all documents including the certificate of protection</i>) NAME(S): Dr. Dale R. Clark ADDRESS(ES): Nutrien Ag Solutions 81 Timberline Drive Bozeman, MT 59718	
11. REPRESENTATIVE TELEPHONE: (+00 (000) 000-0000) 406-223-7336	12. REPRESENTATIVE FAX:
13. REPRESENTATIVE EMAILS: Dale.Clark@Nutrien.com	

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

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OMB Collection #0581-0055*

14. CROP KIND: <i>(Common Name)</i> Wheat (common)	15. GENUS AND SPECIES: Triticum aestivum	16. FAMILY NAME: <i>(Botanical)</i> Poaceae
17. IS THE VARIETY A FIRST-GENERATION HYBRID? <p align="center"> <input type="radio"/> YES <input checked="" type="radio"/> NO </p>		
18. DOES THE VARIETY CONTAIN ANY BIOTECHNOLOGY EVENTS? * <p align="center"> <input type="radio"/> YES <input checked="" type="radio"/> NO </p> <p align="center">*A biotechnology event is defined as a single insertion of a nucleic acid construct into a specific site in a plant's chromosome that is regulated under the U.S. Coordinated Framework for the Regulation of Biotechnology.</p>		
19. SEE ATTACHED CHECKLIST, PLEASE INCLUDE WITH FINAL SUBMISSION		
20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? <i>(See Section 83(a) of the Plant Variety Protection Act)</i> <input type="radio"/> YES <i>(If "yes", answer items 21 and 22 below)</i> <input checked="" type="radio"/> NO <i>(If "no", go to item 23)</i> <input type="radio"/> UNDECIDED		
21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <p align="center"> <input type="radio"/> YES <input type="radio"/> NO </p> IF YES, WHICH CLASSES? <input type="radio"/> FOUNDATION <input type="radio"/> REGISTERED <input type="radio"/> CERTIFIED		
22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <p align="center"> <input type="radio"/> YES <input type="radio"/> NO </p> IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS: FOUNDATION REGISTERED CERTIFIED		
COMMENTS:		

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

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<p>23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?</p> <p align="center"> <input checked="" type="radio"/> YES <input type="radio"/> NO </p> <p>IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES:</p> <p>First unencumbered sale of certified seed was September 15, 2020 in the United States of America</p>			
<p>24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)?</p> <p align="center"> <input type="radio"/> YES <input checked="" type="radio"/> NO </p> <p>IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER:</p>			
<p>25. The owners declare that a viable seed sample will be furnished directly to an acceptable repository in support of the variety within three months of filing. For a tuber propagated variety or vegetatively reproduced variety, a germplasm sample will be deposited in a public repository within three months of the date of the Notice of Allowance letter. These will be maintained for the duration of the certificate. Germplasm will be replenished upon request in accordance with such regulations as may be applicable.</p> <p>The undersigned owner(s) is(are) the owner of this plant variety and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.</p>			
SIGNATURE OF OWNER:		SIGNATURE OF OWNER:	
			
NAME: <i>(Please print or type)</i> Stephanie Franck		NAME: <i>(Please print or type)</i>	
CAPACITY OR TITLE:	DATE:	CAPACITY OR TITLE:	DATE:
Owner	10.09.21		

19. CHECK LIST: (Please include with final submission)

ST-470 APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE



Owner and Variety Information.

See UPOV Explanatory Notes on Variety Denominations Under the UPOV Convention
(https://www.upov.int/edocs/infdocs/en/upov_inf_12_4.pdf)

See UPOV Explanatory Notes on the Definition of Breeder Under the 1991 Act of the UPOV Convention
(https://www.upov.int/edocs/expndocs/en/upov_exn_brd.pdf)



Exhibit A. Origin and Breeding History of the Variety

See UPOV Explanatory Notes On The Definition Of Variety Under The 1991 Act Of The UPOV Convention
(https://www.upov.int/edocs/expndocs/en/upov_exn_var.pdf)



Exhibit B. Statement of Distinctness

See UPOV General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants
(https://www.upov.int/export/sites/upov/resource/en/tg_1_3.pdf)



Exhibit C. Objective Description of Variety

Please submit the Exhibit C matching the subject crop (if one is not available please contact the PVPO)
(<https://www.ams.usda.gov/services/plant-variety-protection/pvpo-c-forms>)

For Distinctness, Uniformity, and Stability (DUS) testing guidance please see UPOV Database of Test Guidelines for Specific Crop Kinds:
(https://www.upov.int/test_guidelines/en/)

An officially issued DUS report may be submitted in place of an Exhibit C for most crops. Additional information may be required during the examination. Please contact PVPO for more information.



Exhibit D. Additional Description of the Variety (Optional)

Additional information and Evidence (Including: Photographs, Data, Genetic Information, Attachments)



Exhibit E. Statement of the Basis of the Owner's Ownership

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 owner is an owner who is not the original owner, both the original owner and the owner must meet one of the above criteria. The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

FILING AND EXAMINATION FEE



Use ePVP, pay.gov, credit card, or make checks and money orders payable to "Treasurer of the United States" Fee of \$5,150 covers application and certificate filing fee.

GERMPLASM DEPOSIT



Germplasm has been deposited with:



Technical Infeasibility of Germplasm Deposit (Please contact PVPO)



Germplasm will be deposited after PVP Certificate Issuance (Potato and Vegetatively Reproduced Varieties)

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

**EXHIBIT A
ORIGIN AND BREEDING HISTORY**

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). OMB Collection #0581-0055

NAME OF OWNER (S): Stephanie Franck	TEMPORARY OR EXPERIMENTAL DESIGNATION: ACS14132-412	VARIETY NAME: Milestone
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I. PROPAGATION:

1. How is the variety propagated?

Sexually Propagated:

Seed

Asexually Propagated:

Bulb

Cutting

Grafting

Layering

Offset

Suckering

Tissue Culture

Tuber

Other (Specify)

II. GENEALOGY:

1. Describe the genealogy of the variety including the ownership, protections (with reference numbers), and origins of the stock plants. Please include the breeding methods used, duration of breeding stages, and any additional testing or development work completed. (Please attach more pages if necessary).

Breeding history of ACS 14132-412 (Milestone):

Parentage: Keldin x Barok

The cross was made in 2007

Keldin is a variety protected and commercial in USA and CDN

Barok is a variety registered and commercial in France, protected in EU

See ATTACHED page

F1-2008: increase of F1-plants

F2-2009: increase of F2 plants

F3-2010: single plants have been harvested after selection for standing power and Fusarium resistance.

F4-2011: plant ear-rows and select between F3-plant-progenies for earliness and

2. Give the details of subsequent stages of selection and multiplication.

Year(s)	Detail of Stage	Selection Criteria
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Exhibit A. II. Genealogy

Breeding history of ACS 14132-412 (Milestone):

Parentage: Keldin x Barok

The cross was made in 2007

Keldin is a variety protected and commercial in USA and CDN

Barok is a variety registered and commercial in France, protected in EU

F1-2008: increase of F1-plants

F2-2009: increase of F2 plants

F3-2010: single plants have been harvested after selection for standing power and Fusarium resistance.

F4-2011: plant ear-rows and select between F3-plant-progenies for earliness and standing power and resistance against fungal diseases, harvest of complete ear-rows.

F5-2012: plant F4-headrow progenies as small plot of 2,5 m², harvest of "best" F3 family.

F6-2013: first yield trial of F3/F5 population in Germany. Selection for earliness, yield performance and quality.

F7-2014: retest F3/F6 Population in Germany. First yield trial in Northern America. Selection of 20 single plants.

F8-2015: Retest in Northern America. Planting of small plots (2,5m²) coming from F7-single plants. Selection for resistance against leaf and ear diseases.

F9-2016: 1st yield trial in Montana. Test of F7/F9 sister-lines. Selection for, yield performance resistance against fungal diseases on leaf's and ears.

F10-2017: Test best sister-lines in Montana and Idaho. Uniformity control of 120 ear-rows per sister-line in Germany.

F11- 2018: Retest finally selected sister-line in Montana and Idaho. 1st line row pre-Breeder seed production - Germany

F12-2019: Breeder seed produced near Buhl, Idaho – harvested 3300 lbs in August, 2019.

**U.S. DEPARTMENT OF AGRICULTURE
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**EXHIBIT A
ORIGIN AND BREEDING HISTORY**

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NAME OF OWNER (S): Stephanie Franck	TEMPORARY OR EXPERIMENTAL DESIGNATION: ACS14132-412	VARIETY NAME: Milestone
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III. UNIFORMITY:

1. YES Is the variety uniform?:

- A. Yes B. No

2. How did you test for uniformity?

Milestone has been observed in yield trials, head row purifications, Breeder, Foundation and Registered seed production for 7 generations.

IV. STABILITY:

1. YES Is the variety stable?:

- A. Yes B. No

2. How did you test for stability? Over how many generations?

Yield trials have been conducted over many different environments (dryland and irrigated) in Montana and Idaho from the F9 thru the F14 generation and it has been found to be stable over those conditions.

3. YES Are genetic variants observed or expected during reproduction and multiplication?

- A. Yes B. No

If Yes, state how these variants may be identified, their type and frequency

A white seed variant may occur at a frequency of up to 10 white seeds per 10,000 seeds. Taller plants (one to two heads taller) may occur at a frequency of up to 10 plants per 10,000 plants and an awnless variant may occur at a frequency of up to 4 plants per 10,000 plants.

**U.S. DEPARTMENT OF AGRICULTURE
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**EXHIBIT B
STATEMENT OF DISTINCTNESS**

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NAME OF OWNER (S): Stephanie Franck	TEMPORARY OR EXPERIMENTAL DESIGNATION: ACS14132-412	VARIETY NAME: Milestone
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BASED ON OVERALL MORPHOLOGY Milestone IS MOST SIMILAR TO KELDIN
(Subject Variety) (Most Similar Variety(ies))

The variety Milestone most clearly differs from KELDIN in the following traits:
(Subject Variety) (Most Similar Variety(ies))

Traits	Subject Variety	Most Similar Variety	Location of Evidence
Qualitative Traits			
Glume Shoulder Head Shape Seed Shape Seed Brush	Elevated Strap Ovate Long	Oblique Tapering Elliptical Medium	objective description objective description objective description objective description
Color Traits			
Quantitative Traits			
Other Traits			
Example			
Leaf Pubescence	Heavy Pubescence	Glabrous	Photograph attached
Leaf Color	Dark Green (5GY 3/4)	Light Green (2.5GY 8/10)	Munsell Color Chart
Plant Height	200 cm +/- 10 cm (N=25)	250 cm +/- 15 cm (N=25)	Statistics attached

Please use additional tables to present clear differences for additional comparison varieties.
Include additional pages of supporting evidence in Exhibit D.

U.S. DEPARTMENT OF AGRICULTURE
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EXHIBIT C
OBJECTIVE DESCRIPTION OF VARIETY

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NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
Stephanie Franck	ACS14132-412	Milestone

Wheat
(Triticum spp.)

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 1.61 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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

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

Instructions:

- Please answer as many fields as possible. Missing information may be requested by the Plant Variety Protection Office. Significant omissions could delay or inhibit certificate of protection issuance.
- Data for quantitative plant characters should be based on a minimum of 100 plants.
- Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used:

Location:

Breeding Location	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
Germany		
Trial Location	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
Montana/Idaho		
Area(s) of Adaptation		
Montana/Idaho		

Morphology:

I. PLANT:

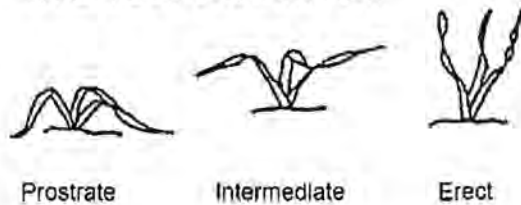
1. 1 Plant Kind:

- | | | |
|-----------|--------------------|-----------|
| 1. Common | 2. Durum | 3. Club |
| 4. Spelt | 5. Poulard | 6. Polish |
| 7. Emmer | 8. Other (Specify) | |

I. PLANT: (continued)

2. 1 Market Class:
- 1. HRW (Hard Red Winter)
 - 2. HRS (Hard Red Spring)
 - 3. HWW (Hard White)
 - 4. SRW (Soft Red Winter)
 - 5. SW (Soft White)
3. 1 2 Vernalization:
- 1. Spring
 - 2. Winter
 - 3. Intermediate
 - 4. Other (Specify)
4. 1 Coleoptile Anthocyanin:
- 1. Absent
 - 2. Present
5. 2 Juvenile Plant Growth:
- 1. Prostrate
 - 2. Prostrate to Semi-Erect
 - 3. Semi-Erect
 - 4. Semi-Erect to Erect
 - 5. Erect

EARLY PLANT GROWTH HABIT:



6. 5 Plant Color: (Boot Stage)
- 1. Yellow-Green
 - 2. Yellow-Green to Green
 - 3. Green
 - 4. Green to Blue-Green
 - 5. Blue-Green
 - 6. Other (Specify)
7. 1 Flag Leaf Orientation: (Boot Stage)
- 1. Erect
 - 2. Erect to Semi-Erect
 - 3. Semi-Erect
 - 4. Semi-Erect to Recurved
 - 5. Recurved
 - 6. Other (Specify)
8. 2 Flag Leaf Type:
- 1. Not Twisted
 - 2. Twisted
9. 2 Flag Leaf Glaucosity:
- 1. Wax Absent
 - 2. Wax Present

MAH
9/17/2021

II. EAR

1. 160 Ear Emergence (Number of Days)
2. 2 Ear Emergence (Number of Days Earlier than* KELDIN)
3. _____ Ear Emergence (Same Number of Days as*)
4. _____ Ear Emergence (Number of Days Later than*)

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

III. ANTHOR:

1. 1 Anther Coloration:
 1. Yellow
 2. Purple
 3. White
 4. Other (Specify)

IV. PLANT HEIGHT:

1. 1 Plant Height Class:
 1. Semi-Dwarf
 2. Standard
2. 83 Plant Height (cm)
3. _____ Plant Height (cm Taller than*)
4. _____ Plant Height (cm Same as*)
5. 5 Plant Height (cm Shorter than* KELDIN)

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

V. STEM:

1. 1 Stem Anthocyanin Coloration:
 1. Absent
 2. Present
 3. Other (Specify)
2. 2 Stem Waxy Bloom:
 1. Absent
 2. Present
3. 2 Stem Hairiness (Last Internode of Rachis)
 1. Absent
 2. Present
 3. Other (Specify)

V. STEM: (continued)

4. 1 Stem: Internode Type:

- | | |
|---------------|-------------------------|
| 1. Hollow | 2. Hollow to Semi-Solid |
| 3. Semi-Solid | 4. Semi-Solid to Solid |
| 5. Solid | 6. Other (Specify) |

STEM INTERNODE CROSS SECTION:



Hollow Semi-solid Solid

5. 5 Stem: Internode: Number of Nodes

6. 1 Stem: Peduncle Type:

- | | |
|---------------|---------------------------|
| 1. Erect | 2. Semi-Erect to Erect |
| 3. Semi-Erect | 4. Recurved to Semi-Erect |
| 5. Recurved | 6. Other (Specify) |

7. 22 Peduncle Length (cm)

8. 1 Auricle Anthocyanin:

- | | |
|-----------|------------|
| 1. Absent | 2. Present |
|-----------|------------|

9. 2 Auricle Hairiness:

- | | | |
|--------------------|------------|--------|
| 1. Absent | 2. Present | 3. Mix |
| 4. Other (Specify) | | |

VI. HEAD:

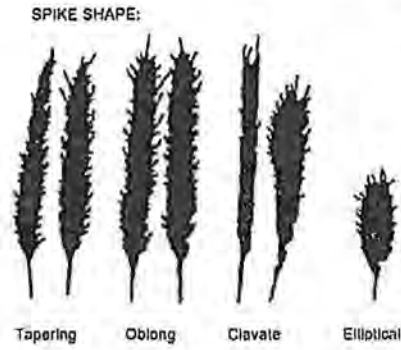
1. 3 Head Density at Maturity:

- | | |
|--------------------------|-----------------------------------|
| 1. Lax | 2. Lax to Mid-Dense (Laxidense) |
| 3. Mid-Dense (Laxidense) | 4. Mid-Dense (Laxidense) to Dense |
| 5. Dense | 6. Other (Specify) |

VI. HEAD: (continued)

2. 2 Head Shape at Maturity:

- 1. Tapering
- 2. Strap
- 3. Clavate
- 4. Elliptical
- 5. Other (Specify)

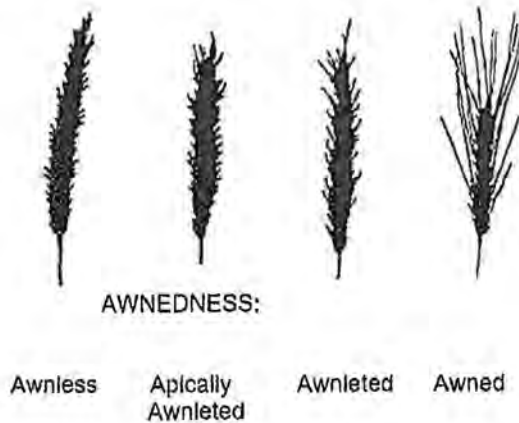


3. 1 Head Curvature at Maturity:

- 1. Erect
- 2. Erect to Inclined
- 3. Inclined
- 4. Inclined to Recurve
- 5. Recurved

4. 4 Head Awnedness at Maturity:

- 1. Awnless
- 2. Apically Awnletted
- 3. Awnletted
- 4. Awned
- 5. Other (Specify)



VII. GLUME:

1. 1 Glume Color at Maturity:

1. White 2. Tan

3. Other (Specify)

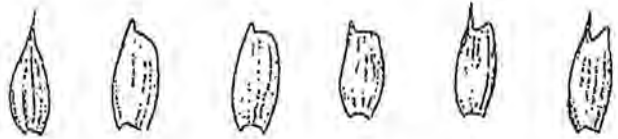
2. 5 Glume Shoulder at Maturity:

1. Wanting 2. Oblique 3. Rounded

4. Square 5. Elevated 6. Apiculate

7. Other (Specify)

SHOULDER SHAPE:



Wanting Oblique Rounded Square Elevated Apiculate

3. 3 Glume Shoulder Width at Maturity:

1. Narrow 2. Narrow to Medium 3. Medium

4. Medium to Wide 5. Wide

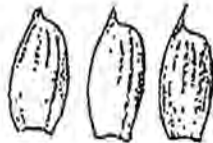
4. 3 Glume Beak Shape at Maturity:

1. Obtuse 2. Acute 3. Acuminate

4. Acute to Obtuse 5. Acuminate to Acute 6. Acuminate to Obtuse

7. Other (Specify)

BEAK SHAPE:



Obtuse Acute Acuminate

5. 5 Glume Beak Length at Maturity:

1. Very Short 2. Very Short to Short 3. Short

4. Short to Medium 5. Medium 6. Medium to Long

7. Long 8. Long to Very Long 9. Very Long

6. _____ Glume Beak Length at Maturity (cm)

VII. GLUME: (continued)

7. 3 Glume Beak Width:
- | | | |
|-------------------|---------------------|-----------|
| 1. Narrow | 2. Narrow to Medium | 3. Medium |
| 4. Medium to Wide | 5. Wide | |
8. _____ Glume Beak Width at Maturity (cm)
9. 3 Glume Length at Maturity:
- | | | |
|--------------------|--------------------|------------------|
| 1. Short (~7mm) | 2. Short to Medium | 3. Medium (~8mm) |
| 4. Medium to Long | 5. Long (~9mm) | 6. Very Long |
| 7. Other (Specify) | | |
10. 3 Glume Width at Maturity:
- | | |
|--------------------|---------------------|
| 1. Narrow (~3mm) | 2. Narrow to Medium |
| 3. Medium (~3.5mm) | 4. Medium to Wide |
| 5. Wide (~4mm) | 6. Other (Specify) |
11. 2 Glume Pubescence at Maturity:
- | | |
|-----------|------------|
| 1. Absent | 2. Present |
|-----------|------------|

VIII. SEED:

1. 1 Seed Shape:
- | | | |
|--------------------|------------------------|-----------------------|
| 1. Ovate | 2. Oval | 3. Elliptical |
| 4. Ovate to Oval | 5. Ovate to Elliptical | 6. Oval to Elliptical |
| 7. Other (Specify) | | |

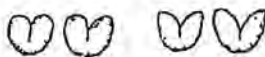
SEED SHAPE:



Ovate Oval Elliptical

2. 1 Seed Cheek:
- | | | |
|------------|------------|--------|
| 1. Rounded | 2. Angular | 3. Mix |
|------------|------------|--------|

CHEEK SHAPE:



Rounded Angular

VIII. SEED: (continued)

3. 5 Seed Brush:

- 1. Short
- 2. Short to Medium
- 3. Medium
- 4. Medium to Long
- 5. Long

BRUSH HAIR LENGTH:

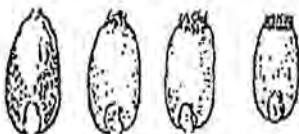


Short Medium Long

4. 1 Seed Brush Collar:

- 1. Not Collared
- 2. Collared

BRUSH SIZE



Small Mid-sized Large Collared

5. 3 Seed Crease Width:

- 1. Narrow (Width of 60% or Less of Kernel)
- 2. Narrow to Mid-wide
- 3. Mid-Wide (Width of 80% or Less of Kernel)
- 4. Mid-wide to Wide
- 5. Wide (Nearly as Wide as Kernel)

SEED CREASE WIDTH:



Narrow Mid-wide Wide

VIII. SEED: (continued)

6. 1 Seed Crease Depth:

- 1. Shallow (Depth 20% or Less of Kernel)
- 2. Shallow to Mid-deep
- 3. Mid-deep (Depth of 25% or Less of Kernel)
- 4. Mid-deep to Deep
- 5. Deep (Depth of 50% or Less of Kernel)

SEED CREASE DEPTH:



Shallow



Mid-Deep



Deep

7. 3 Seed Color:

- 1. White
- 2. Amber
- 3. Red
- 4. Other (Specify)

8. 1 Seed Texture:

- 1. Hard
- 2. Soft
- 3. Intermediate
- 3. Other (Specify)

9. 4 Seed Phenol Reaction (See Instructions for More Information):

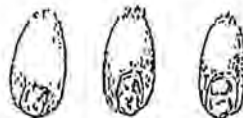
- 1. Ivory
- 2. Fawn
- 3. Light Brown
- 4. Dark Brown
- 5. Black
- 6. Other (Specify)

10. 45 Seed Weight (g per 1000 Seeds, Whole Number Only)

11. 3 Seed Germ Size

- 1. Small
- 2. Small to Medium
- 3. Medium
- 4. Medium to Large
- 5. Large

GERM (EMBRYO) SIZE:



Small Mtdsized Large

IX. DISEASE:

1. Disease: Please Indicate the Specific Race or Strain Tested

(0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Intermediate, 4 = Tolerant)

- | | |
|---|-------|
| 1. ____ Stem Rust (<i>Puccinia graminis</i> 6. sp. <i>tritici</i>) | Race: |
| 2. ____ Leaf Rust (<i>Puccinia recondita</i> 6. sp. <i>tritici</i>) | Race: |
| 3. ____ Stripe Rust (<i>Puccinia striiformis</i>) | Race: |
| 4. ____ Loose Smut (<i>Ustilago tritici</i>) | Race: |
| 5. ____ Powdery Mildew (<i>Erysiphe graminis</i> 6. sp. <i>tritici</i>) | Race: |
| 6. ____ Common Bunt (<i>Tilletia tritici</i> or <i>T. laevis</i>) | Race: |
| 7. ____ Dwarf Bunt (<i>Tilletia controversa</i>) | Race: |
| 8. ____ Karnal Bunt (<i>Tilletia indica</i>) | Race: |
| 9. ____ Flag Smut (<i>Urocystis agropyri</i>) | Race: |
| 10. ____ Tan Spot (<i>Pyrenophora tritici-repentis</i>) | Race: |
| 11. ____ Halo Spot (<i>Selenophoma donacis</i>) | Race: |
| 12. ____ <i>Septoria</i> spp. | Race: |
| 13. ____ <i>Septoria nodorum</i> (Glume Blotch) | Race: |
| 14. ____ <i>Septoria avenae</i> (Speckled Leaf Disease) | Race: |
| 15. ____ <i>Septoria tritici</i> (Speckled Leaf Blotch) | Race: |
| 16. ____ Scab (<i>Fusarium</i> spp.) | Race: |
| 17. ____ "Snow Molds" | Race: |
| 18. ____ Kernel Smudge ("Black Point") | Race: |
| 19. ____ Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.) | Race: |
| 20. ____ Barley Yellow Dwarf Virus (BYDV) | Race: |
| 21. ____ Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>) | Race: |
| 22. ____ Soilborne Mosaic Virus (SBMV) | Race: |
| 23. ____ Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>) | Race: |
| 24. ____ Wheat Yellow (Spindle Streak) Mosaic Virus | Race: |
| 25. ____ Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>) | Race: |
| 26. ____ Wheat Streak Mosaic Virus (WSMV) | Race: |
| 27. ____ Take-All | Race: |
| 28. ____ Foot-Rot | Race: |
| 29. ____ Brown Necrosis | Race: |
| 30. ____ Cephalosporium | Race: |

IX. DISEASE: (continued)

1. Disease: Please Indicate the Specific Race or Strain Tested (continued)

(0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Intermediate, 4 = Tolerant)

- 31. ____ Ergot Race:
- 32. ____ Fusarium spp. Race:
- 33. ____ Other (Specify) Race:
- 34. ____ Other (Specify) Race:
- 35. ____ Other (Specify) Race:
- 36. ____ Other (Specify) Race:

2. Homozygous for Specific Disease Resistance Gene

(0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Intermediate, 4 = Tolerant)

- 1. ____ Stem rust
- 2. ____ Stripe rust
- 3. ____ Leaf rust
- 4. ____ Other (Specify)

X. PESTS:

1. INSECT: PLEASE SPECIFY BIOTYPE (Where Needed)

(0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Intermediate, 4 = Tolerant)

- 1. ____ Stem Sawfly (*Cephus* spp.) (Specify)
- 2. ____ Cereal Leaf Beetle (*Oulema melanopa*) (Specify)
- 3. ____ Russian Aphid 1 (*Diuraphis noxia*)
- 4. ____ Russian Aphid 2 (*Diuraphis noxia*)
- 5. ____ Greenbug (*Schizaphis graminum*) (General)
- 6. ____ Greenbug (*Schizaphis graminum*) Biotype A
- 7. ____ Greenbug (*Schizaphis graminum*) Biotype B
- 8. ____ Greenbug (*Schizaphis graminum*) Biotype C
- 9. ____ Greenbug (*Schizaphis graminum*) Biotype E
- 10. ____ Greenbug (*Schizaphis graminum*) Other (Specify)
- 11. ____ Aphids (Specify)
- 12. ____ Other (Specify)
- 13. ____ Hessian Fly (*Mayetiola destructor*) Biotype A
- 14. ____ Hessian Fly (*Mayetiola destructor*) Biotype B
- 15. ____ Hessian Fly (*Mayetiola destructor*) Biotype C

X. PESTS: (continued)

1. INSECT: PLEASE SPECIFY BIOTYPE (Where Needed)

(0 = Not Tested, 1 = Susceptible, 2 = Resistant, 3 = Intermediate, 4 = Tolerant)

- 16. ____ Hessian Fly (*Mayetiola destructor*) Biotype D
- 17. ____ Hessian Fly (*Mayetiola destructor*) Biotype E
- 18. ____ Hessian Fly (*Mayetiola destructor*) Biotype F
- 19. ____ Hessian Fly (*Mayetiola destructor*) Biotype G
- 20. ____ Hessian Fly (*Mayetiola destructor*) Biotype GP
- 21. ____ Hessian Fly (*Mayetiola destructor*) Biotype H
- 22. ____ Hessian Fly (*Mayetiola destructor*) Biotype I
- 23. ____ Hessian Fly (*Mayetiola destructor*) Biotype J
- 24. ____ Hessian Fly (*Mayetiola destructor*) Biotype L
- 25. ____ Hessian Fly (*Mayetiola destructor*) Biotype M
- 26. ____ Hessian Fly (*Mayetiola destructor*) Biotype N
- 27. ____ Hessian Fly (*Mayetiola destructor*) Biotype O
- 28. ____ Hessian Fly (*Mayetiola destructor*) (specify)

XI. ADDITIONAL INFORMATION:

1. High Molecular Weight Glutenin Subunit Profile (Check those that apply):

Glu-A1

- 1
- 2*
- null
- 1*

Glu-B1

- 6+8
- 7+8
- 7+9
- 13+16
- 13+19
- 17+18

Glu-D1

- 2+11
- 2+12
- 3+12
- 5+10
- null

2. Translocations

(1=Present, 2=Absent, 3=Heterogeneous, 4= Not Tested):

____ 1BL/1RS

- 1
- 2
- 3
- 4

____ 1A/1R

- 1
- 2
- 3
- 4

____ 2NS/2AS

- 1
- 2
- 3
- 4

____ 4DL/4AgS

- 1
- 2
- 3
- 4

XI. ADDITIONAL INFORMATION: (continued)

3. Herbicide Tolerance:

(1=Present 2=Absent 3=Not Tested)

A. Imadazolinone Tolerance Genes:

1. 2 Als-1

2. 2 Als-2

3. 2 Als-3

B. Quizalofop Tolerance Genes:

1. 2 ACC-A1

2. 2 ACC-B1

3. 2 ACC-D1

4. End Use Quality:

- 1. Grain Protein 10-13%
- 2. Flour Protein 9-12%
- 3. SDS 95-100
- 4. Farniograph _____
- 5. Other _____

[PLEASE ENTER ADDITIONAL VARIETY TRAITS ON NEXT PAGE]

Disease Resistance:

Insect Resistance:

Comments:

For more information and guidance:
UPOV GUIDELINES FOR THE CONDUCT OF TESTS FOR DISTINCTNESS, UNIFORMITY AND STABILITY TG/003
<https://www.upov.int/edocs/tgdocs/en/tg003.pdf>

References:

- (a) L.W. Briggie and L.P. Reitz. 1963. Classification of Triticum Species and Wheat Varieties Grown in the United States. Technical Bulletin 1278. United States Department of Agriculture.
- (b) W.S. Walls. 1965. A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity. Contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts.

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

**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).
OMB Collection #0581-0055*

NAME OF OWNER (S): Stephanie Franck	TEMPORARY OR EXPERIMENTAL DESIGNATION: ACS14132-412	VARIETY NAME: Milestone
--	--	--------------------------------

1. Does the owner own all rights to the variety?

- YES NO

If NO, please explain.

2. Is the owner a U.S. national or a U.S. based entity?

- YES NO

If NO, give name of country:

Germany

3. Is the owner the original owner?

- YES NO

If NO, please answer one of the following:

A. If the original rights to the 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 the 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:

4. Additional explanation on ownership (Trace ownership from original breeder to current owner)