

No.



201400385

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Ledeboer Seed LLC

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

An application requesting a certificate of protection for an alleged distinct variety of sexually reproduced, or tuber propagated plant, the name and description of which are contained in the application and exhibits, a copy of which is hereunto annexed and made a part hereof, and the various requirements of law in such cases made and provided have been complied with, and the title thereto is, from the records of the PLANT VARIETY PROTECTION OFFICE, in the applicant(s) indicated in the said copy, and whereas, upon due examination made, the said applicant(s) is (are) adjudged to be entitled to a certificate of plant variety protection under the law.

Now, therefore, this certificate of plant variety protection is to grant unto the said applicant(s) and the successors, heirs or assigns of the said applicant(s) for the term of TWENTY years from the date of this grant, subject to the payment of the required fees and periodic replenishment of viable basic seed of the variety in a public repository as provided by law, the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or conditioning it for propagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different variety there from, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

RYEGRASS, PERENNIAL

'Veracruz'



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 ninth day of December, in the year two thousand and fifteen.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE		The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995. Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).	
APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE (Instructions and information collection burden statement on reverse)			
1. NAME OF OWNER Ledeboer Seed LLC		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME SD-2.CH	3. VARIETY NAME Veracruz
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 22068 Case Rd. NE Aurora, OR 97002		5. TELEPHONE (include area code) 503-501-2430	FOR OFFICIAL USE ONLY PVPO NUMBER 201400385
		6. FAX (include area code) 503-482-7420	FILING DATE 7/2/2014
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Limited Liability Partnership	8. IF INCORPORATED, GIVE STATE OF INCORPORATION Oregon	9. DATE OF INCORPORATION May 6, 2007	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Hagen Ledebor 22068 Case Rd. NE Aurora, OR 97002		11. TELEPHONE (Include area code) 503-501-2430 x101	FILING AND EXAMINATION FEES: \$ 4,382 DATE 7/2/2014 CERTIFICATION FEE: \$ DATE
		12. FAX (Include area code) 503-482-7420	
13. E-MAIL hagen.ledeboer@ledeboerseed.com			
14. CROP KIND (Common Name) Perennial ryegrass	15. GENUS AND SPECIES NAME OF CROP Lolium perenne	16. FAMILY NAME (Botanical) Poaceae	
17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input type="checkbox"/> NO (If "no", go to item 23) <input checked="" type="checkbox"/> UNDECIDED	
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED	
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Filing and Examination Fee (\$4,382), make checks payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office) other methods of payment explained in the instructions		22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. 2 FOUNDATION 2 REGISTERED 5 CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)	24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)		
25. The owners declare that a viable sample of basic seed will be furnished directly to an acceptable depository in support of the variety within three months of filing. Seed will be replenished upon request in accordance with such regulations as may be applicable. For a tuber propagated variety or vegetative propagated parent of the variety, a tissue culture or vegetative sample will be deposited in a public repository within three months of the date of the certificate fee request letter. These will be maintained for the duration of the certificate. The undersigned owner(s) is (are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER Hagen Ledebor		SIGNATURE OF OWNER	
NAME (Please print or type) Hagen Ledebor		NAME (Please print or type)	
CAPACITY OR TITLE Research Director	DATE 6/27/2014	CAPACITY OR TITLE	DATE

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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.)*

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).)*

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<p>U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE</p> <p>EXHIBIT A – ORIGIN AND BREEDING HISTORY ** Use additional pages as needed.</p>		<p>FOR OFFICIAL USE ONLY</p> <p>PVPO NUMBER</p> <p style="font-size: 1.2em;">201400385</p>														
<p>1. Name of Owner</p> <p>Ledeboer Seed LLC</p>	<p>2. Temporary Designation or Experimental Name</p> <p>SD-2.CH</p>	<p>3. Variety Name</p> <p>Veracruz</p>														
<p>4. Describe the genealogy (back to and including public and commercial varieties, lines, or clones used) and the breeding method(s). **</p> <p>Single plant selection from a 1200 plant breeder block of SD-2 (NGVRB approved as Mensa Perennial Ryegrass in 2013). Seed from this single plant exhibited compound seed head structure was hand harvested, processed separately and used to begin development of the cultivar. Breeding method was matched phenotypic selection for similar growth habit, color, texture and 100% compound seed head development through over three generations to produce breeder seed. Each generation was produced and maintained in isolation, with a minimum border distance of 2500 feet from any other perennial ryegrass seed production.</p> <p>**Complete discovery and breeding history attached as a separate document.</p>																
<p>5. Give the details of subsequent stages of selection and multiplication. **</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Year</th> <th style="width: 45%;">Detail of Stage</th> <th style="width: 40%;">Selection Criteria</th> </tr> </thead> <tbody> <tr> <td>2010</td> <td>Initial single plant is discovered in a 1200 plant isolated crossing block of Syn-3 seed from experimental perennial ryegrass designated SD-2. Harvested seed separately and designated it Syn-1 SD-2.CH</td> <td>Selection was based entirely and solely on the development of compound seed heads in the single plant. other outward appearances showed no significant differences from surrounding plants in block</td> </tr> <tr> <td>2011</td> <td>Syn-1 SD-2.CH designated seed from original plant was used to produce a block of plants for further selection and refinement. Harvested seed was designated Syn-2 SD-2.CH</td> <td>Again, selection was based primarily on compound seed head development, but also included phenotypically similar plants.</td> </tr> <tr> <td>2012</td> <td>Syn-2 SD-2.CH designated seed was used to produce a larger crossing block for Syn-3 SD-2.CH seed.</td> <td rowspan="2">Final selection criteria was based upon 100% of remaining plants producing compound seed heads and having uniform color, texture and growth habit.</td> </tr> <tr> <td>2013</td> <td>Syn-3 SD-2.CH seed was used to produce a large isolation block for SD-2.CH designated breeder seed.</td> </tr> </tbody> </table>			Year	Detail of Stage	Selection Criteria	2010	Initial single plant is discovered in a 1200 plant isolated crossing block of Syn-3 seed from experimental perennial ryegrass designated SD-2. Harvested seed separately and designated it Syn-1 SD-2.CH	Selection was based entirely and solely on the development of compound seed heads in the single plant. other outward appearances showed no significant differences from surrounding plants in block	2011	Syn-1 SD-2.CH designated seed from original plant was used to produce a block of plants for further selection and refinement. Harvested seed was designated Syn-2 SD-2.CH	Again, selection was based primarily on compound seed head development, but also included phenotypically similar plants.	2012	Syn-2 SD-2.CH designated seed was used to produce a larger crossing block for Syn-3 SD-2.CH seed.	Final selection criteria was based upon 100% of remaining plants producing compound seed heads and having uniform color, texture and growth habit.	2013	Syn-3 SD-2.CH seed was used to produce a large isolation block for SD-2.CH designated breeder seed.
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2013	Syn-3 SD-2.CH seed was used to produce a large isolation block for SD-2.CH designated breeder seed.															
<p>6. Is the variety uniform? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>How did you test for uniformity?</p> <p>large blocks of space plants (600 - 1200 plants each) selected for uniformity (color, texture, growth habit, 100% compound seed head production)</p>																
<p>7. Is the variety stable? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>How did you test for stability? Over how many generations?</p> <p>Selections from large space plantings were made to increase variety stability. Three subsequent generations were selected for compound seed head production and uniformity for color, texture and growth habit.</p>																
<p>8. Are genetic variants observed or expected during reproduction and multiplication? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, state how these variants may be identified, their type and frequency.</p> <p>Mixed seed head production of both compound seed heads and normal spikes may occur infrequently -> .5% ^{< 0.5%} of plant population</p>																

dbc 05/18/2015

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

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EXHIBIT B – STATEMENT OF DISTINCTNESS

**** Use additional tables to present clear differences for additional comparison varieties. Use additional pages to present supporting evidence.**

1. Name of Owner Ledeboer Seed LLC	2. Temporary Designation or Experimental Name SD-2.CH jrm 7/6/15	3. Variety Name Veracruz
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Based on overall morphology, Veracruz is most similar to ~~*all perennial ryegrass cultivars~~ Fiesta 4 Veracruz most clearly differs from ~~*all perennial ryegrass cultivars~~ Fiesta 4 in the following traits Name the specific trait. Then list the value of that trait for each variety in the comparison. Submit appropriate supporting evidence (see the [Guidelines for Presenting Evidence in Support of Variety Distinctness in the instructions](#)):

	<i>Eg. Leaf Pubescence</i> <i>Eg. Leaf Color</i> <i>Eg. Plant Height</i>	<i>heavy pubescence</i> <i>Dark Green (5GY 3/4)</i> <i>200 cm +/- 10 cm (N=25)</i>	<i>glabrous</i> <i>Light Green (2.5GY 8/10)</i> <i>250 cm +/- 15 cm (N=25)</i>	<i>photograph attached</i> <i>Munsell Color Chart</i> <i>statistics attached</i>
	1. Qualitative traits:	2. Color traits:	3. Quantitative traits:	4. Other traits:
Application Variety	Veracruz *Compound Spike	Dark Green RHS 137A The Royal Horticultural Society color chart	*Compound Spike	*see attached photographs
Comparison Variety 1	Fiesta 4 *normal spike	Dark Green RHS 139A The Royal Horticultural Society color chart	*Normal spike	*see attached photographs
Comparison Variety 2				
Comparison Variety 3				

**** Use additional tables to present clear differences for additional comparison varieties. Use additional pages to present supporting evidence.**

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

OBJECTIVE DESCRIPTION OF VARIETY
Ryegrass (*Lolium* spp.)

Exhibit C

Replacement 05/08/2015

NAME OF APPLICANT (S) Ledeboer Seed LLC	TEMPORARY OR EXPERIMENTAL DESIGNATION SD-2.CH	VARIETY NAME Veracruz
ADDRESS (Street and No. or RD No., City, State, Zip Code and Country) 22068 Case Rd. NE Aurora, OR 97002		FOR OFFICIAL USE ONLY PVPO NUMBER 201400385

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Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. 0/8/9 or 0/9) when number is either 99 or less or 9 or less. Descriptions of characters should represent those that are typical for the variety. Measured data must be for SPACED PLANTS. Give additional description for all characteristics that cannot be adequately described in the form below. Append all pertinent comparative trial and evaluation data.

Cultural Conditions

All measurements must be on spaced plants with a minimum of (30 cm) between plants. A minimum of 30 plants and 60 data points must be used for all measurements. Plants must be established no later than the previous fall for spring and summer measurements. Trials should be irrigated and stem rest control practiced. Cultural conditions must be stated in comment section and plant number / data points shown in all tables.

1. SPECIES

2 1 = *L. multiflorum* (annual or italian) includes Westerwoldicum 2 = *L. perenne* (Perennial) 3 = *L. rigidum* (includes Wimmeria)

4 = Hybrid (of species): _____

5 = Other (specify): _____

2. PLOIDY

1 1 = Diploid 2 = Tetraploid 3 = Other (specify): _____

3. DURATION

3 1 = Annual or Biennial 2 = Short lived perennial (3-4 Years) 3 = Perennial (more than 4 years)

STANDARD CULTIVARS – Choose cultivars from same species, ploidy level and usage.

L. MULTIFLORUM		L. PERENNE		L. RIGIDUM	HYBRID
DIPLOID	TETRAPLOID	DIPLOID	TETRAPLOID		
1 = GULF	4 = TETRONE	8 = LINN	14 = CONDESSA	17 = WIMMERA 62	18 = OREGREEN
2 = MARSHALL	5 = MERITRA RVP	9 = MANHATTAN	15 = CITIDEL		19 = BISON
3 = SURREY	6 = CARUMBA	10 = ELKA	16 = FANTOON		
	7 = URBANA	11 = PENNFINE-EARLY		20 = _____	(Specify species and ploidy)
		12 = MANHATTAN II			
		13 = PINNACLE			
		21 = FIESTA 4			

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4. MATURITY (When 50% of plants in the variety have at least 3 spikes emerged from boot.) Use standards from above for comparison

 Calendar Day.
 1 = Very Early () 5 = Medium () 9 = Very Late ()
 Days Earlier Than 21
 n/a Same as —
 0 5 Days Later Than 13

ANTHESIS DATE (When 50% of plants in the variety have at least 3 spikes in anthesis.)

 Calendar Day.
 0 9 Days Earlier Than 21
 n/a Same as —
 0 7 Days Later Than 13

5. PLANT HEIGHT (Post - Anthesis) Middle tiller. Not to include tallest 3 heads.

Mature Height (ground to top of spike - straightened.)

 6 3 cm High —
 1 1 Shorter Than 21
 n/a Same As —
 n/a Taller Than —

Flag Leaf Height (Ground to collar of flag leaf.)

 3 4 cm High —
 0 9 Shorter Than 21
 n/a Same As —
 n/a Taller Than —

6. TURF DENSITY (Tiller density - specify clipped / unclipped, growth conditions and plant age.)

 6 4 5 Tillers per Plant 100 sq.cm in 11 month old turf seeded at 5lb/1000 sq. ft - mowing height 1.25"
 n/a Less Tillers Than —
 0 9 8 More Tillers Than 21

7. LEAF CHARACTERISTICS

Flag Leaf (After anthesis.)

 0 1 9 cm Length (ligule to tip) 0 0 5 mm Width (at 1 cm from collar)
 0 0 3 cm Shorter Than 0 0 1 cm Narrower Than 21
 n/a Same As — n/a Same As —
 n/a cm Longer Than — n/a mm Wider Than —

Flag Leaf at Boot Stage * percent plants with:

 0 3 3 Deflexed 0 3 3 Semi-erect
 n/a Recurve n/a Erect
 0 3 3 Horizontal

7. LEAF CHARACTERISTICS (continued)

Sheath Length of Flag Leaf (Flag Leaf Collar to Subtending Node.)

0 1 1 cm Length
0 0 2 cm Shorter Than 21
n/a Same As —
n/a cm Longer Than —

Genetic Foliage Color (Summer)

9 Leaf Color 1 - 9 2 = Elka 3 = Pennfine 5 = Manhattan
 6 = Pinnacle 9 = Dark Green

3 Vernation (On vegetative tillers) 1 = Leaves Rolled
 2 = Leaves Semi-Rolled
 3 = Leaves Folded

15 % Plants With Anthocyanin In Lower Leaf Sheath (at 3 - 8 tiller stage)

8. SPIKE (Post - Anthesis) Spikelet and Glume measurements must be in lower 1/3 of Spike.

<u>2 1 0</u> mm Spike Length (tip to internode)		<u>0 7 1</u> mm Secondary Spike Length (tip to primary spike axis)
<u>0 2 0</u> mm Shorter Than <u>21</u>	<u>— — —</u>	
<u>n/a</u> Same As <u>—</u>	<u>— — —</u>	
<u>n/a</u> mm Longer Than <u>—</u>	<u>— — —</u>	
<u>1 9 0</u> Number of Spikelets/Spike	<u>0 0 8</u> Number of Florets/Spikelet	
<u>n/a</u> Less Than <u>—</u>	<u>0 0 1</u> Less Than <u>21</u>	
<u>n/a</u> Same As <u>—</u>	<u>n/a</u> Same As <u>—</u>	
<u>1 6 5</u> More Than <u>21</u>	<u>n/a</u> More Than <u>—</u>	
<u>0 1 0</u> mm Length of Spikelets	<u>0 0 5</u> mm Length of Outer Glume	
<u>0 0 4</u> mm Less Than <u>21</u>	<u>0 0 3</u> Less Than <u>21</u>	
<u>n/a</u> Same As <u>—</u>	<u>n/a</u> Same As <u>—</u>	
<u>n/a</u> mm More Than <u>—</u>	<u>n/a</u> Mm More Than <u>—</u>	

PERCENTAGE PLANTS WITH:

Rachis :	<u>100</u> % Smooth	<u>— — —</u> % Rough
Spike Color :	<u>0 7 0</u> % All Green	<u>0 3 0</u> % With Anthocyanin
Lemma :	<u>0 0 0</u> % Awned	<u>— — —</u> mm Awn Length
Anther Color: (Pre-Dehiscent)	<u>0 8 0</u> % White Or Beige Anthers	<u>0 2 0</u> % Yellow Anthers
	<u>0 0 0</u> % Purple Anthers	

9. SEED – From PVP nursery (not commercial sample). All seed must be processed similarly. Specify how data collected.

1 9 1 4 mg per 1,000 seeds (each plant was hand harvested, processed and then bulked - seed sample was then taken from bulked seed)

0 5 1 mm Total Length of 10 seeds

0 1 0 mm Total Width of 10 seeds

0 0 5 mm Lemma Length (average of 50) 0 0 1 mm Lemma Width (average of 50)

0 0 1 mm Less Than 21 n/a mm Less Than —

n/a Same As — — — — Same As 21

n/a mm More Than — n/a mm More Than —

10. SEEDLING CHARACTERS

1 0 0 % Plants with Anthocyanin in Coleoptile
___ ___ % Albinos

11. ROOT AND PLANT CHARACTERS

0 0 7 Growth Habit 1- 9 1=Prostrate 9=Upright
0.2 0 % of Plants with Fluorescent Roots - Unlifted/Bright
0.5 0 % of Plants with Fluorescent Roots - Lifted/Hidden

12. DISEASE (0 = Not Tested, 2 = Highly Susceptible, 4 = Moderately Susceptible, 6 = Moderately Resistant, 9 = Highly Resistant)

Specify disease causing organism (Species)

6 Crown Rust (Puccinia coronata) 0 Dollar Spot (Sclerotinia)
0 Brown Patch (Rhizoctonia) 6 Leaf Spot (Helminthosporium)
6 Stem Rust 0 Snow Mold (Typhula)
5 Red Thread (Corticium) ___ Other (Specify)

13. INSECT (0 = Not Tested, 2 = Highly Susceptible, 4 = Moderately Susceptible, 6 = Moderately Resistant, 9 = Highly Resistant)

0 Please Specify:
Must specify with or without endophyte present

14. Give resemblance value in left column and variety code number in the right column for variety with which comparison is made (1 = less than, 2 = same as, 3 = more erect, more resistant, denser, more persistent, darker or greater height.)

Table with 3 columns: Resemblance, Character, Similar Variety. Includes a legend for variety codes: 1 = Gulf, 2 = Wimmeria 62, 3 = Linn, 4 = Pelo, 5 = Norlea, 6 = Aberystwyth S-23, 7 = Manhattan, 8 = Pennfine, 9 = Fiesta 4.

18. Give Area Of Adaptation And Intended Use Western Oregon - turf for landscapes, athletic fields, home lawns and golf courses and any other areas where perennial ryegrass is normally used.

19. Give Area Test Results Presented From n/a Aurora, OR 2013, 2014

20. COMMENTS: Variety is unique in appearance and development of reproductive seed heads. Each spike consists of 15 to 25 secondary spikes that break from the main spike at each point where normally a single spikelet would form. Each secondary spike consists of 8 to 10 spikelets, each with 7 to 9 florets. Potential seed yield is dramatically increased over normal perennial ryegrass plants, given the same growing conditions and environment. This new type of compound spike has never been documented before in perennial ryegrass. Photographs (Fig 1., Fig 2.) and Spikelet/Floret count table attached (Table 1.). Trial was done in Aurora, OR on Willamette silt loam soil with a 5.4 pH. 4 lbs of N per year (per 1000 sq. ft.) applied in split applications balance fertilizer. Space plants were on 2 ft. centers, 60 plants per variety. Block was irrigated as needed to prevent stress. Fiesta 4 was used as the primary comparison variety due to its high ratings in the previous and current NTEP Perennial Ryegrass Trials.

Compound Spike Perennial Ryegrass

Discovery and Breeding History

Location: Aurora, OR Ledebauer Seed LLC Turfgrass Research Farm

In mid-May, 2010, while observing a 1200 plant isolation block of the perennial ryegrass variety SD-2 (Mensa) that was being grown for Syn-4 breeder's seed, a single plant was observed to have distinctly different seed heads emerging from its sheaths. Normal perennial ryegrass seed heads consist of a single spike for each reproductive tiller with between 15 to 30 small spikelets attached directly to the main axis. The single observed plant had multiple compound seed heads in the form of secondary spikes growing at each point on the main spike axis where normally a single spikelet would be produced - See comparison Fig.1, Fig.2 below. Each primary spike consisted of multiple secondary spikes (15-25); each having five to ten spikelets. On both normal and the observed compound spike plant, each spikelet consisted of between seven and nine individual florets (potential seed). Thus, the observed compound spike plant had the potential to produce up to four times as many seeds as the normal spike seed head plants. As perennial ryegrass plants are not self-compatible, the compound seed head plant was marked with a flag and allowed to inter-pollinate with the surrounding normal perennial ryegrass plants. At harvest in mid July, the compound seed head plant was hand harvested separately from all other plants. The seed was then hand thrashed and cleaned separately as well. This seed was labeled Syn-1 SD-2.CH. In the fall of 2010, a 600 plant isolated crossing block was established using the Syn-1 SD-2.CH seed. Throughout the fall, winter and spring growing seasons, the crossing block was closely observed for any undesirable characteristics and for uniformity. After full seed head emergence in the spring, but prior to anthesis (flowering), 223 plants with undesirable characteristics and without compound spikes were removed and destroyed. The remaining plants (377) were observed and documented as having 100% compound seed heads. These remaining plants were allowed to inter-pollinate and the resulting seed was hand harvested, hand cleaned and bulked. This seed was then labeled Syn-2 SD-2.CH and placed into cold storage. In the fall of 2011, a 600 plant isolated crossing block was established using the Syn-2 SD-2.CH seed. These 600 plants were again observed throughout the fall, winter and early spring for uniform color, texture and growth habit. During this observation period, 97 plants were removed and destroyed due to undesirable characteristics. After full seed head emergence, but prior to anthesis, and additional 13 plants were removed due to lack of compound spike production. The remaining 490 plants were then allowed to inter-pollinate and the resulting seed was hand harvested, cleaned and bulked. This seed was then labeled Syn-3 SD-2.CH and then placed in cold storage. In the fall of 2012, this Syn-3 SD-2.CH seed was used to establish a 1200 plant isolated block for the production of breeder seed. The block was observed throughout the growing season for uniform color, texture and growth habit. After seed head emergence and prior to anthesis, nine plants were removed due to lack of uniformity and/or non-compound spike production. The remaining 1191 plants were then allowed to inter-pollinate and the resulting seed was hand harvested, cleaned, bulked and designated SD-2.CH (Veracruz) breeder seed.

Fig.1 (before full growth and anthesis) Head of Veracruz

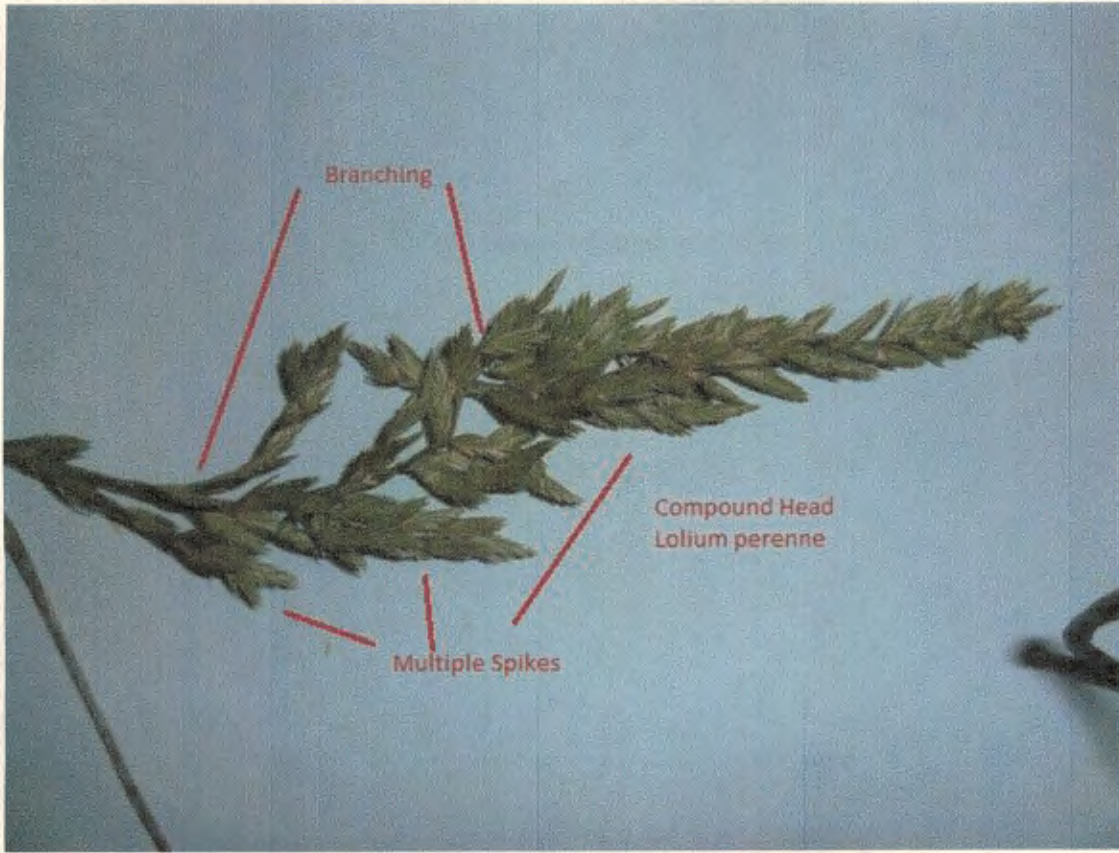
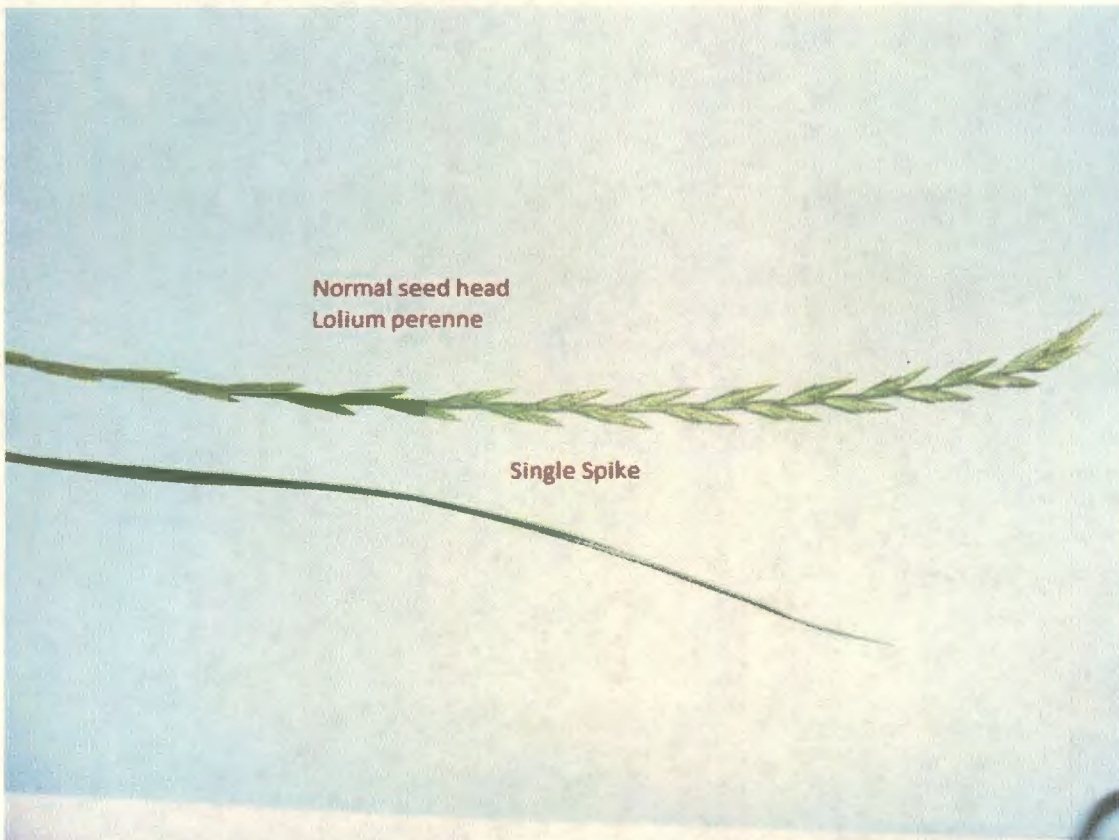


Fig.2 Head of Fiesta 4



dbc 05/18/2015

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Compound Seed Head Spike/Floret Counts vs. Normal Spike/Floret Counts

Variety/Sample #	# of Secondary Spikes	# of Spikelets	Avg. # of Florets/Spikelet
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Veracruz

Sample No. 1	23	184	8
2	22	179	8
3	21	192	8
4	23	240	7
5	19	176	9
6	19	156	7
7	21	179	8
8	22	181	8
9	21	195	7
10	17	164	7
11	16	159	7
12	15	154	8
13	19	179	9
14	21	184	9
15	18	166	7
16	18	179	7
17	23	178	8
18	24	214	7
19	25	237	7
20	23	216	9
21	21	194	7
22	23	197	8
23	24	217	7
24	18	174	7
25	19	179	8
26	24	216	9
27	23	211	7
28	21	201	7
29	19	191	7
30	20	194	8
Average	21	190	8
Avg # of Seed/Spike IF 100% viability: 1520 (Avg # spikelets * Avg # of Florets per Spikelet)			

Fiesta 4

Sample No. 1	n/a	28	9
2	n/a	28	11
3	n/a	27	9
4	n/a	24	9
5	n/a	25	9
6	n/a	27	11

7	n/a	24	9
8	n/a	22	11
9	n/a	25	11
10	n/a	26	9
11	n/a	27	8
12	n/a	25	9
13	n/a	27	11
14	n/a	26	11
15	n/a	28	9
16	n/a	27	9
17	n/a	25	11
18	n/a	24	7
19	n/a	25	7
20	n/a	22	9
21	n/a	21	9
22	n/a	26	9
23	n/a	24	11
24	n/a	24	9
25	n/a	25	9
26	n/a	25	11
27	n/a	24	7
28	n/a	28	9
29	n/a	25	9
30	n/a	26	11

Average **N/A** **25** **9**
Avg # of Seed/Spike IF 100% viability: **225 (Avg # spikelets * Avg # of Florets per Spikelet)**

dbc 03/11/2015

The morphological comparison trials were done as follows:

60 space plants of each variety planted on two foot centers in an isolated comparison block

Trial was located at our research station near Aurora, OR

Final comparison data was collected over a two year period from 2013 and 2014.

The trial was grown on Willamette Silt Loam soil with a pH of 5.4. Approximately 4lbs of N in a balance fertilizer was applied

per 1000 sq. ft., per year.

Block was irrigated as needed to prevent stress.

(per H. Ledebuer 05/08/2015)



Heads of Veracruz

Head of Fiesta 4 (left)

Heads of Veracruz (below)

201400385

file: 05/19/2015
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EXHIBIT E - STATEMENT OF THE BASIS OF OWNERSHIP

1. Name of Owner Ledeboer Seed LLC	2. Temporary Designation or Experimental Name SD-2.CH	3. Variety Name Veracruz
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4. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain. YES NO

5. Is the applicant a U.S. national or a U.S. based entity? If no, give name of country. YES NO

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

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

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

7. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

PLEASE NOTE:

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

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

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