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THE
UNIVERSITY OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
AND
UTAH AGRICULTURAL EXPERIMENT STATION
UTAH STATE UNIVERSITY
LOGAN, UTAH
AND
UNIVERSITY OF AGRICULTURE
SOIL CONSERVATION SERVICE

ANNOUNCE THE RELEASE OF
VAVILOV SIBERIAN CRESTED WHEATGRASS

VAVILOV Siberian crested wheatgrass [Agropyron fragilis (Roth) Candargy] was named to acknowledge the contribution of the N.I. Vavilov Research Institute of Plant Industry, St. Petersburg, Russia (VIR) to the germplasm resources of the USDA-ARS range grass breeding program. This institute is celebrating its 100th anniversary in 1994. The parental germplasm for cultivar VAVILOV was derived from accessions originally received from VIR; Stavropol Botanical Garden, Stavropol, Russia; Eskisehir Plant Breeding Station, Eskisehir, Turkey; and selections from the cultivar P-27. The parental accessions were originally selected on the basis of green-color retention and vegetative vigor during the late summer under extreme drought conditions on a range site in Box Elder County, Utah. During the development of the cultivar, the breeding population was screened for three cycles for vegetative vigor; response to drought, diseases and insects; seedling vigor; seed yield; and plant type. Open-pollinated progenies from 14 selected clonal lines in the third breeding cycle were bulked to form Breeder seed.

Seedling vigor of VAVILOV, as indicated by establishment in field trials and seedling emergence from deep seedings, is comparable to the cultivar Hycrest and is consistently better than the check cultivar P-27. It has produced significantly more forage dry matter than P-27 in most evaluation trials. Limited data indicate slightly lower digestibility (IVDMD) than P-27; however, levels of Mg, Ca, and K in the forage indicate that it is less likely to cause grass tetany in grazing animals than P-27. The cultivar produced 450 kilograms of seed per hectare (400 pounds/acre) when grown in rows 1 meter apart on a dryland site that received 35 centimeters (14 inches) of annual precipitation. Supplemental irrigation would increase seed yields about 50 percent. At 100 percent purity, there are approximately 330,000 seeds per kilogram (150,000 seeds per pound).

VAVILOV is a tetraploid (2n=28) and is fully interfertile with cultivars of Standard crested wheatgrass [Agropyron desertorum (Fisch. ex Link) Schultes] as well as the cultivar Hycrest. Cytological studies show that Siberian crested wheatgrass shares the same genome (P') with other diploid (2n=14), tetraploid, and hexaploid (2n=42) forms of the crested wheatgrass complex. Siberian wheatgrass is a perennial bunch grass characterized by linear, narrow, and relatively long spikes. Genetic introgression occurs between the Siberian and Standard forms in nature, and a gradation between the long-narrow
spike of Siberian and the shorter and wider spike of Standard is evident in the VAVILOV breeding population.

In its native habitat, the Siberian form of crested wheatgrass is more drought-resistant than either Standard or Fairway \( \text{Agropyron cristatum (L.) Gaertner s. lat.} \) and is better adapted to sandy soils than other crested wheatgrass types. The cultivar VAVILOV is recommended for semiarid range sites receiving from 20 to 45 centimeters (8 to 18 inches) of precipitation annually at altitudes up to 2,100 meters (7,000 feet). When drilled under dryland range conditions, a seeding rate of 8 kilograms per hectare (7 pounds per acre) is recommended.

Breeder, Foundation, and Certified seed classes will be recognized. Breeder seed will be maintained by the USDA-ARS Forage and Range Research Laboratory at Logan, UT. Foundation seed will be produced by the USDA-ARS at Logan and distributed to seed growers by the Utah Crop Improvement Association. Protection has been applied for under the Plant Variety Protection Act of 1970. Conditions of this license specify that seed of the cultivar VAVILOV can be marketed only as a class of certified seed. For information regarding supplies of foundation seed, contact:

Stanford Young  
Utah Crop Improvement Association  
Plants, Soils, and Biometeorology Department  
Utah State University  
Logan, UT 84322-4820  
(801) 797 2082

Release date for publicity purposes shall be effective on the date of the final signature on the release notice.

APPROVAL SIGNATURES:

JUL 01 1994  
Date

Howard J. Mark  
Administrator  
U.S. Department of Agriculture

May 24, 1994  
Date

Director  
Utah Agricultural Experiment Station

June 22, 1994  
Date

Chief  
Soil Conservation Service  
U.S. Department of Agriculture
Table 1. Stand establishment, forage yield, moisture content, and forage quality of 25 grasses evaluated at Curlew Grasslands site near Stone, Idaho at 25-30 centimeters (10-12 inches) of annual precipitation.

<table>
<thead>
<tr>
<th>Entry</th>
<th>Stand Dry Matter Yield</th>
<th>Dry Matter Yield</th>
<th>-- Kilograms/plot --</th>
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<tbody>
<tr>
<td>BBWG Goldar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vavilov</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CWG P-27</td>
<td>2.3 2.5 2.5 5.5</td>
<td>0.16 0.88 0.52</td>
<td></td>
</tr>
<tr>
<td>CWG Broadleaf X Reg</td>
<td>5.5 6.0 5.5 5.5</td>
<td>0.13 0.69 0.41</td>
<td></td>
</tr>
<tr>
<td>CWG Broadleaf</td>
<td>6.0 6.3 5.5 5.5</td>
<td>0.19 0.88 0.53</td>
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</tr>
<tr>
<td>CWG Ephraim</td>
<td>4.0 4.3 7.0</td>
<td>0.13 1.01 0.57</td>
<td></td>
</tr>
<tr>
<td>CWG Hycrest R89</td>
<td>5.8 6.5 6.8 7.8</td>
<td>0.16 0.88 0.52</td>
<td></td>
</tr>
<tr>
<td>CWG Hycrest NLF</td>
<td>7.8 8.0 8.0 9.0</td>
<td>0.33 1.30 0.82</td>
<td></td>
</tr>
<tr>
<td>CWG New Hybrid</td>
<td>7.0 7.5 7.0 8.5</td>
<td>0.26 1.15 0.71</td>
<td></td>
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<tr>
<td>CWG Nordan</td>
<td>6.0 7.0 6.8 5.0</td>
<td>0.22 1.05 0.58</td>
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<tr>
<td>CWG R (Iran Turf)</td>
<td>5.5 6.5 6.0 7.3</td>
<td>0.10 1.14 0.62</td>
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</tr>
<tr>
<td>LC Hybrid</td>
<td>2.0 1.5 1.0 1.0</td>
<td>0.01 0.00 0.01</td>
<td></td>
</tr>
<tr>
<td>P. 1ibanotica</td>
<td>2.0 0.5 1.0 0.8</td>
<td>0.00 0.00 0.00</td>
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<tr>
<td>P. nodosum</td>
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<td>0.00 0.00 0.00</td>
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<tr>
<td>Pseudopyron</td>
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<td>0.00 0.00 0.00</td>
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<tr>
<td>RMR Bozoiisky</td>
<td>3.8 5.3 4.8 7.0</td>
<td>0.13 0.50 0.31</td>
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</tr>
<tr>
<td>RMR Cabree</td>
<td>3.3 4.3 4.0 5.0</td>
<td>0.12 0.47 0.29</td>
<td></td>
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<tr>
<td>RMR Syn A</td>
<td>4.8 5.3 5.0 6.0</td>
<td>0.13 0.42 0.28</td>
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<tr>
<td>RMR Vinall</td>
<td>4.5 3.8 3.8 4.8</td>
<td>0.09 0.31 0.20</td>
<td></td>
</tr>
<tr>
<td>SL Hybrid</td>
<td>1.8 1.3 1.0 1.0</td>
<td>0.01 0.00 0.01</td>
<td></td>
</tr>
<tr>
<td>SSWG Secar</td>
<td>1.3 1.0 1.0 1.0</td>
<td>0.01 0.00 0.01</td>
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</tr>
<tr>
<td>TSWG T-21076</td>
<td>3.0 2.5 1.0 1.0</td>
<td>0.02 0.00 0.02</td>
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<tr>
<td>WWG Rosana</td>
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<td>0.01 0.00 0.01</td>
<td></td>
</tr>
<tr>
<td>WWG Syn</td>
<td>1.3 0.8 1.0 0.8</td>
<td>0.00 0.00 0.00</td>
<td></td>
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</tbody>
</table>

Mean 3.8 4.0 3.8 4.3 0.11 0.86 0.39  
LSD (0.05) 1.4 1.2 1.1 1.5 0.04 0.28 0.14
Table 2. Stand and dry matter yield of 34 grasses at Utah State University
Blue Creek Experiment Station (average annual precipitation 36.6
centimeters, 14.4 inches).

<table>
<thead>
<tr>
<th></th>
<th>Stand</th>
<th>Dry Matter Yield</th>
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<tbody>
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<td>6.8 4.3 4.0 3.5</td>
<td>1.12 0.54 0.93</td>
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<tr>
<td>BBWG P-27</td>
<td>6.3 5.8 6.5 7.0</td>
<td>1.91 1.84 1.87</td>
</tr>
<tr>
<td>BBWG Vavilov</td>
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<td>1.87 1.86 1.86</td>
</tr>
<tr>
<td>BBWG 6X-BLR</td>
<td>5.8 5.5 6.0 6.8</td>
<td>1.30 1.67 1.49</td>
</tr>
<tr>
<td>BBWG 6X-BL</td>
<td>5.8 6.5 6.3 6.5</td>
<td>1.50 1.68 1.59</td>
</tr>
<tr>
<td>BBWG Ephraim</td>
<td>7.0 8.3 8.3 8.0</td>
<td>1.95 1.75 1.85</td>
</tr>
<tr>
<td>BBWG Fairway</td>
<td>6.0 8.0 7.5 7.8</td>
<td>2.07 1.61 1.84</td>
</tr>
<tr>
<td>BBWG Hycrest R89</td>
<td>8.8 9.0 9.0 8.8</td>
<td>2.81 1.89 2.35</td>
</tr>
<tr>
<td>BBWG Hycrest NLF</td>
<td>0.5 8.8 8.3 8.8</td>
<td>2.61 2.12 2.36</td>
</tr>
<tr>
<td>BBWG New Hybrid</td>
<td>7.8 8.5 8.0 8.5</td>
<td>2.24 1.82 2.03</td>
</tr>
<tr>
<td>BBWG Nordan</td>
<td>5.5 7.3 7.3 8.5</td>
<td>2.36 2.00 2.18</td>
</tr>
<tr>
<td>BBWG R (Iran Turf)</td>
<td>6.8 6.5 6.8 8.0</td>
<td>1.88 1.81 1.84</td>
</tr>
<tr>
<td>L. ang. Prairieland</td>
<td>3.5 5.3 4.0 4.0</td>
<td>0.70 1.01 0.86</td>
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<td>0.012 0.67 0.39</td>
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<td>L. karelinii</td>
<td>3.0 4.5 3.0 2.0</td>
<td>0.56 0.58 0.57</td>
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<tr>
<td>LC Hybrid</td>
<td>6.8 7.0 5.5 4.3</td>
<td>1.56 0.51 1.04</td>
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<tr>
<td>P. nodosum</td>
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<td>1.53 0.62 1.07</td>
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<tr>
<td>RS-1 Hybrid</td>
<td>7.3 5.3 4.8 5.0</td>
<td>1.48 0.88 1.18</td>
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<td>RS-Hoffman</td>
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<td>1.75 1.14 1.45</td>
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<td>RS-Miles City</td>
<td>7.8 6.3 5.8 7.3</td>
<td>2.05 1.36 1.71</td>
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<td>RS-Spic Type</td>
<td>4.5 4.8 3.8 5.3</td>
<td>1.68 1.30 1.49</td>
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<td>1.74 1.47 1.61</td>
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<td>1.20 1.05 1.12</td>
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<td>0.96 0.80 0.88</td>
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<td>1.24 0.91 1.07</td>
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<td>RMR Syn-A (F)</td>
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<td>1.31 0.81 1.06</td>
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<td>RMR Tetracan</td>
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<td>0.95 0.92 0.93</td>
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<tr>
<td>RMR Vinall</td>
<td>5.3 6.5 6.5 6.0</td>
<td>0.89 0.78 0.83</td>
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<tr>
<td>SL Hybrid</td>
<td>7.0 6.5 6.5 6.5</td>
<td>1.61 0.78 1.20</td>
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<td>SRMG Secar</td>
<td>3.8 3.0 4.3 4.3</td>
<td>0.99 0.60 0.80</td>
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<tr>
<td>TSWG Critana</td>
<td>5.0 6.8 6.0 5.3</td>
<td>1.88 0.75 1.32</td>
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<td>TSWG T-21076</td>
<td>5.8 6.8 6.5 6.3</td>
<td>1.78 1.22 1.50</td>
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<tr>
<td>WG Rosana</td>
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<td>1.37 1.64 1.50</td>
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<tr>
<td>WG Syn</td>
<td>3.0 5.8 6.8 8.0</td>
<td>1.18 1.49 1.33</td>
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<tr>
<td><strong>MEAN</strong></td>
<td>5.9 6.4 6.2 6.6</td>
<td>1.53 1.25 1.39</td>
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<tr>
<td>LSD (0.05)</td>
<td>1.0 1.0 1.3 1.2</td>
<td>0.41 0.32 0.29</td>
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</table>

1/ 1 = worst, 9 = best
Table 3. Stand and dry matter yield of 30 grasses evaluated on semiarid site near Logan, Utah (Deerpens).

<table>
<thead>
<tr>
<th>Entry</th>
<th>Stand</th>
<th>Dry Matter Yield</th>
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</thead>
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<tr>
<td></td>
<td>87</td>
<td>88</td>
</tr>
<tr>
<td>-Percent-</td>
<td></td>
<td></td>
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<tr>
<td>AI Hybrid (E86)</td>
<td>94</td>
<td>90</td>
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<tr>
<td>IWG Greenar</td>
<td>74</td>
<td>76</td>
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<tr>
<td>Altai wildrye</td>
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<td>35</td>
</tr>
<tr>
<td>BBWG Whitmar</td>
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<td>2</td>
</tr>
<tr>
<td>Vavilov</td>
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<td>83</td>
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<tr>
<td>CWG Siberian (P-27)</td>
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<tr>
<td>CWG Hycrest (NL86-F)</td>
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<td>90</td>
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<tr>
<td>CWG Hycrest (2, DP86)</td>
<td>81</td>
<td>86</td>
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<tr>
<td>CWG Hycrest (3, DP86)</td>
<td>73</td>
<td>80</td>
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<tr>
<td>CWG Hycrest (E86)</td>
<td>83</td>
<td>86</td>
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<tr>
<td>CWG Hycrest (DP82)</td>
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<td>88</td>
</tr>
<tr>
<td>CWG Nordan</td>
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<td>59</td>
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<tr>
<td>CWG Siberian Common</td>
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<td>64</td>
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<td>CWG C6BL (DP)</td>
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<td>91</td>
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<td>L. karelinii</td>
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<td>Nodosum</td>
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<td>P. libanotica (86)</td>
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<td>RS Hoffman</td>
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<td>RS Hybrid (MC Increase)</td>
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<td>84</td>
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<td>RS-1 (E86)</td>
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<td>73</td>
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<td>RS-1 (Spic Type)</td>
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<td>85</td>
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<td>RST Hybrid (E85)</td>
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<td>RMR Bozoisky (DP86)</td>
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<td>78</td>
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<td>RMR Syn-A (F86)</td>
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<td>60</td>
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<td>RMR Syn-B (D86)</td>
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<td>RMR Vinall</td>
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<td>55</td>
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<tr>
<td>SL Hybrid (E86)</td>
<td>80</td>
<td>84</td>
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<tr>
<td>TSWG Critana</td>
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<td>73</td>
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<tr>
<td>Mean</td>
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<td>72</td>
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<tr>
<td>LSD (0.05)</td>
<td>14</td>
<td>10</td>
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Table 4. Stand and dry matter yield of 15 grasses at Soda Lake, Wyoming.

<table>
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<tr>
<th>Entry</th>
<th>Stand 92 Rating</th>
<th>Stand 93 Rating</th>
<th>Dry Weight (93) g/Plot</th>
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<tr>
<td>BBWG Goldar</td>
<td>6.5</td>
<td>7.8</td>
<td>257.0</td>
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<td>8.5</td>
<td>7.5</td>
<td>373.8</td>
</tr>
<tr>
<td>Vavilov</td>
<td>5.2</td>
<td>6.2</td>
<td>321.5</td>
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<tr>
<td>CWG 6X-BL</td>
<td>6.2</td>
<td>6.2</td>
<td>154.5</td>
</tr>
<tr>
<td>CWG 6X-BLR</td>
<td>6.0</td>
<td>6.8</td>
<td>193.0</td>
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<td>CWG Hycrest R</td>
<td>7.5</td>
<td>8.2</td>
<td>414.2</td>
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<tr>
<td>CWG New Hybrid</td>
<td>5.0</td>
<td>6.8</td>
<td>244.2</td>
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<td>CWG Nordan</td>
<td>6.0</td>
<td>7.8</td>
<td>414.0</td>
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<td>CWG Turf (R)</td>
<td>8.0</td>
<td>8.2</td>
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<td>5.0</td>
<td>180.8</td>
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<td>7.0</td>
<td>230.0</td>
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<td>RWR Syn-A (E-91)</td>
<td>7.5</td>
<td>7.5</td>
<td>225.2</td>
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<td>4.0</td>
<td>179.8</td>
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<td>TSWG Critana</td>
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<td>154.0</td>
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<td>7.5</td>
<td>248.0</td>
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<td>Mean</td>
<td>6.0</td>
<td>6.8</td>
<td>253.2</td>
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<td>LSD (0.05)</td>
<td>1.8</td>
<td>0.9</td>
<td>72.0</td>
</tr>
</tbody>
</table>

\(^1/\) 1 = worst, 9 = best
Table 5. Stand ratings of perennial grasses seeded in replicated trials at Dugway Proving Grounds, Utah (Burn Site).

<table>
<thead>
<tr>
<th>Entry</th>
<th>Stand Rating¹/²</th>
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<td></td>
<td>1991</td>
<td>1993</td>
<td></td>
</tr>
<tr>
<td>CWG 6X-BL</td>
<td>1.9</td>
<td>1.0</td>
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</tr>
<tr>
<td>CWG 6X-BLR</td>
<td>2.6</td>
<td>3.3</td>
<td></td>
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<tr>
<td>CWG Ephraim</td>
<td>4.4</td>
<td>5.0</td>
<td></td>
</tr>
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<td>CWG Hycrest</td>
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<td>5.5</td>
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<tr>
<td>CWG P-27</td>
<td>1.3</td>
<td>1.5</td>
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</tr>
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¹ = worst and 9 = best stand
TABLE 6. Emergence from deep seedlings and vigor of seedlings of Vavilov breeding population.

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N. I. Vavilov Institute of Plant Industry
42 Herzen Street
190000, St. Petersburg, RUSSIA

Edie Allen
Systems Ecology Research Group
College of Sciences
San Diego State University
San Diego, CA 92182-0401

Bruce Anderson
Department of Agronomy
353 Keim Hall
University of Nebraska
Lincoln, NE 68583

John Aspitarte
Bureau of Land Management
400 West F Street
P.O. Box 2B
Shoshone, ID 83352

A. A. Baltensperger
Agronomy & Horticulture Department
Box 3Q
New Mexico State University
Las Cruces, NM 88003

David D. Baltensperger
Panhandle Research & Extension Center
University of Nebraska-Scottsbluff
4502 Avenue 1
Scottsbluff, NE 69361
R. E. Barker
National Forage Seed Production Center
Oregon State University
3450 SW Campus Way
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Donald K. Barnes
USDA-ARS
Dept. of Agron. & Plant Genetics
University of Minnesota
St. Paul, MN 55108

Thomas E. Bedell
Dept. of Rangeland Resources
Oregon State University
Corvallis, Oregon 97331

John D. Berdahl
USDA-ARS
Northern Great Plains Research Lab.
P.O. Box 459
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C. C. Berg
USDA-ARS
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OO-ALC/EMX
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A. A. Boe
NPB 244A
Plant Science Dept.
South Dakota State University
Brookings, SD 57007

Botany & Plant Sciences Dept.
University of California
Riverside, CA 92521

Bureau of Land Management
2300 West 2370 South
salt Lake City, UT 84111
Byron L. Burson  
USDA-ARS  
Soil and Crop Science Dept.  
Texas A&M University  
College Station, TX 77843

Glenn W. Burton  
USDA-ARS  
Coastal Plain Experiment Station  
Tifton, GA 31793

Stuart M. Cannon  
HQ USA Forces Command  
Fort McPerson, GA 30330-6000

Irving T. Carlson  
Department of Agronomy  
Iowa State University  
Ames, IA 50011

J. R. Carlson  
USDA-SCS-TISD  
2625 Redwing Road  
suite 110  
Ft. Collins, CO 80526

M. D. Casler  
Department of Agronomy  
University of Wisconsin  
1575 Linden Drive  
Madison, WI 53706

Raymond L. Clark  
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Burns OR 97720
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N. J. Ehike  
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Don Floyd  
Research Agronomist  
Pickseed west Inc.  
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Tim Ford  
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Huntsville, UT 84317

C. R. Funk  
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P. O. Box231  
Rutgers University  
New Brunswick, NJ 08903
M. R. George
Department of Agronomy and Range Science
University of California - Davis
Davis, CA 95616

Jacy Gibbs
USDA Soil Conservation Service
Room 124, 3244 Elder Street
Boise, ID 83705

Wes Green
Bureau of Reclamation
Federal Bldg.
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and Range Research Station
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coastal Plains Experiment Station
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J. L. Holecheck  
Department of Animal and Range Sciences  
New Mexico State University  
Las Cruces, NM 88003

Larry Holsworth  
USDA-Soil Conservation Service  
10 East Babcock Street  
Bozeman, MT 59715

R. D. Horrocks  
Department of Agronomy & Horticulture  
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Oseco Incorporated
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CANADA

Jacklin seed Co.
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Paul G. Jefferson
Agriculture Canada, Research Station
P.O. Box 1030
Swift Current, Sask. S9H 3X2

Kendall Johnson
Range Resources Department
University of Idaho
Moscow, ID 83843

R. R. Kalton
Department of Agronomy
Iowa State University
Ames, IA 50011

G. A. Kielly
Agriculture Canada Research Station
P.O. Box 1030
Swift Current, SASK. S9H 3X2

L. J. Klebesadel
Box 817
Palmer, Alaska 99645

David Koch
Plant science Dept.
4009 Agriculture Building
University of Wyoming
Laramie, WY 82071

Charles A. Laible
Funk Seeds International
1300 W. International Street
Bloomington, IL 61701
Scott M. Lambert  
USDA-SCS  
Rock Pointe Tower II, Suite 450  
316 W. Boone Ave.  
Spokane, WA 99201-2348

William A. Laycock  
Department of Range Management  
Box 3354, University Station  
University of Wyoming  
Laramie, WY 82071

W. Eric Limbach  
Department of Biological Sciences  
Campus Box 8007  
Idaho State University  
Pocatello, ID 83209

Jeff C. Linn  
Range Management Branch  
HG Fort Carson & 4th Infantry Division (Mech)  
AFZC-ECM-NR Building 302  
Fort Carson, CO 80913-5000

Max G. Long  
Department of Agriculture, Seed Branch  
2015 South First Street MS-3  
Yakima, Washington 98903

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Provo, UT 84606

T. J. McCoy  
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Bozeman, MT 59717

Kirk C. McDaniel  
Animal and Range Sciences Dept.3-1  
Box 30003  
Las Cruces, New Mexico 88003-0003

Michael L. McInnis  
Ag. Prog., 204 Zabel Hall  
Eastern Oregon State College  
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Department of Crop and Soil Sciences  
Washington State University  
Pullman, WA 99164-6420

Steven B. Monsen  
USDA-Forest Service  
Shrub Sciences Laboratory  
735 North 500 East  
Provo, UT 84606

Jack A. Morgan  
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Crops Research Laboratory  
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Ft. Collins, CO 80526

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Route 4, Box 1255  
Woodland, CA 95695

Dale Pocock  
Sunnybank Seed Farm  
Box 749  
Nipawin, Sask., CANADA S0E 1E0
Neil Poulson
Poulson Seed Company
2849 Noah Pleasant Valley Road
American Falls, ID 83211

Jerry T. Quisenberry
Cropping Systems Research Laboratory
Route 3, Box 215
Lubbock, TX 79401

Jon Reich
Vista Research
Box 1428
Woodland, CA 95695-1428

S. C. Schank
2183 McCarty Hall
University of Florida
Gainesville, FL 32611

John G. Scheetz
USDA-SCS Plant Materials Center
Route 1 Box 1189
Bridger MT 59014

John A. Schilling
Asgrow Seed Company
9672-190-16
Kalamazoo, MI 59001

Lynn Schultz
Kenneth C-Long Seeds
Box 100
spring Cooly, Alberta
CANADA TOK 2CO

Fred Schumacher
RR2, Box 231
Kindred, ND 58051

Gerald Schuman
USDA-ARS
High Plains Grasslands Research Station
8408 Hildreth Road
Cheyenne, WY 82009
M. C. Shannon
USDA-ARS
U. S. Salinity Laboratory
4500 Glenwood Drive
Riverside, CA 92501

Sharp Bros. Seed Co.
P. O. Box 140
Healy, KS 67850

Nancy Shaw
U. S. Forest Service
315 Myrtle Street
Boise, ID 83702

Sergey V. Shuvalov
Foreign Relations
N. I. Vavilov Institute of Plant Industry
42 Herzen Street
190000, St Petersburg RUSSIA

D. A. Sleper
Dept. of Agronomy
University of Missouri
Columbia, MO 65211

Richard R. Smith
USDA-ARS
1925 Linden Drive West
University of Wisconsin
Madison, WI 53706

Richard Stevens
Great Basin Experiment Station
Ephraim, UT 84627

Sam E. Stranathan
USDA-Soil Conservation Service
655 Parfet St.
Room E200C
Lakewood CO 80215-5517

Sam Stratton
FFR Cooperative
4112 East State Road 225
West Lafayette, IN 47906
Roger Styner  
Grassland West Co.  
P.O. Box 489  
Clarkston, WA 99403  

C. M. Taliaferro  
Dept. of Agronomy  
Oklahoma state Univ.  
Stillwater, OK 74078  

Treasure State Seed Company  
P.O. Box 698  
Fairfield, MT 59436  

Uinta County Extension Office  
228 9th Street  
Evanston WY 82930  

USDA-ARS  
Snake River Conservation Research Center  
Route 1, Box 386  
Kimberly, ID 83341  

USDA-SCS  
P.O. Box 68  
Lackeford, CA 95237  

K. P. Vogel  
USDA-ARS  
Department of Agronomy  
University of Nebraska-Lincoln  
Lincoln, NE 68583-0910  

Peggy Wagoner  
Rodale Research Center  
R. D. #1, Box 323  
Kutztown, PA 19530  

P. D. Walton  
Department of Plant Science  
416E Agriculture and Forestry Building  
University of Alberta  
Edmonton, Alberta CANADA T6G 2P5
Richard S. White
Kansas Agric. Exp. Stn.
RR 2, Box 830
Colby, Kansas 67701

Richard Wilson
Utah Department of Agriculture
315 North Redwood Road
Salt Lake City, Utah 84116-3087

Al Winward
USDA-Forest Service (R-4)
Ogden, UT 84401

Gary Young
USDA-SCS Plant Materials Center
P.O. Box AA
Aberdeen, Idaho 83210

James A. Young
USDA-ARS
920 Valley Road
Reno, NV 89512