# 2022 Rule Change Proposal #4 - Amended

**Purpose of Proposal:** To add *Bromus riparius* × *B. inermis,* hybrid bromegrass, to Volume 1, Table 2A of the AOSA Rules for Testing Seeds.

# Present Rule: None

Proposed Rule: Volume 1. Principles and Procedures

Table 2A. Weights for working samples.

Pure Seed Unit #	Chaffy (C) or Super Chaffy (SC)ª	Kind of Seed	Minimum weight for purity analysis <sup>b</sup>	Minimum weight for noxious weed seed or bulk examination	Approximate number of seeds per ablgram <sup>c</sup>	Approximate number of seeds per ounce <sup>d</sup>
			Grams	Grams	Number	Number
22		Bromus riparius Rehmann × B.				
		inermis Leyss.				
		hybrid bromegrass	12.5	125	239	6789

## Table 3A. Pure seed unit definitions

Description of Pure Seed Unit
Multiple floret spikelet, multiple floret, or floret, with or without pedicel, with or
without awn(s), provided there is a caryopsis at least one-third the length of the palea
measured from the base of the rachilla.
Caryopsis or piece of broken caryopsis larger than one-half of the original size.
The amount of inert matter attached to the multiple units shall be determined by the
method described in section 3.7.
Special consideration:
* When coated seed units are de-coated for purity analysis the method in section 3.7 shall not be used. Separation of multiple units shall be as follows:
- A fertile floret attached to another fertile floret shall be separated.
- Attached glumes and empty florets extending to or beyond the tip of the fertile
floret shall be removed and classified as inert matter.
* In case of <i>Elymus virginicus</i> (Virginia wildrye):
- The method described in section 3.7 shall not be applied.
- Upon request, the percentage by weight of multiple seed units found in a sample can be reported under other determinations on the report of analysis.
* In case of Festuca ovina, F. rubra subsp. fallax, F. rubra subsp. rubra, and
F. trachyphylla and Bromus riparius $\times$ B. inermis:
- The multiple unit procedure shall not be applied. The method described in section 3.7 shall not be applied.
<ul> <li>Upon request, the percentage by weight of multiple seed units found in a sample can be reported under other determinations on the report of analysis.</li> </ul>

### Harmonization statement:

*Bromus riparius*  $\times$  *B. inermis,* hybrid bromegrass, is not currently listed in the Federal Seed Act Regulations, the Canadian Methods and Procedures for Testing Seeds, or the International Rules for Seed Testing. This species is sold as a new forage crops in Canada and the United States. Adding a pure seed unit definition and working weights to the AOSA Rules will ensure standard testing procedures for its fair seed trade and testing uniformity among laboratories.

**Supporting Evidence:** Hybrid bromegrass is generated by crossing meadow bromegrass (*Bromus riparius*) and smooth bromegrass (*B. inermis*), which is a slightly creeping, winter hardy, long-lived perennial, dual purpose forage grass for both hay and pasture systems. Two varieties, Knowles and Success, were released in 2000 (Coulman, 2004) and 2003 (Coulman, 2006), and one variety 'BigFoot' was released from USDA as a new forage crop. Since the superior quality of hybrid bromegrass in fast growth and high yield than their parental species (Coulman, 2004 and 2006), it was widely used as forage in Canada and the USA.



Pure Seed Unit: 22 (seed morphological feature was provided in Figure 1)

Figure 1: Florets of Hybrid Bromegrass *Bromus riparius* × *B. inermis* 

The procedures outlined in Section 13 of Volume 1 of the AOSA Rules for Testing Seeds were followed to determine the minimum weight for purity analysis and the approximate number of seeds per gram. Seed counts were conducted on seed lots specified in the Table 1 and the method and calculation was presented in the support Excel document. The coefficient of variation for non-chaffy seeds (6.0%) (4.0) was not exceeded.

Seed Lot	1	2	3	4	5	6	7	8	9	10
Variety	Success	Success	Knowles	Knowles	Success	Success	Success	Knowles	Knowles	Knowles
Year of harvest	NA	NA	2017	2017	2005	NA	1999	2000	1999	2003
Rep1	0.4162	0.4173	0.3762	0.4592	0.4771	0.3802	0.4496	0.4227	0.4379	0.3861
Rep2	0.4216	0.3814	0.3823	0.4754	0.4685	0.3833	0.4445	0.4335	0.4128	0.4004
Rep3	0.4049	0.3923	0.3518	0.4442	0.4581	0.3746	0.4522	0.4585	0.4604	0.3826
Rep4	0.4134	0.4010	0.3796	0.4547	0.4735	0.3697	0.4619	0.4237	0.4449	0.3885
Rep5	0.4170	0.4020	0.3751	0.4493	0.472	0.3866	0.4500	0.4380	0.4429	0.3749
Rep6	0.4130	0.3941	0.3878	0.4676	0.4599	0.3936	0.4587	0.4381	0.4518	0.3901
Rep7	0.4265	0.3939	0.3545	0.4681	0.4628	0.3954	0.4600	0.4345	0.4563	0.3884
Rep8	0.4216	0.4019	0.3833	0.4529	0.4694	0.3990	0.4842	0.4250	0.4518	0.4007
CV (%)	1.59	2.61	3.58	2.32	1.45	2.68	2.68	2.68	3.34	2.00
Average weight of reps (g)	0.4168	0.3980	0.3738	0.4589	0.4677	0.3853	0.4576	0.4343	0.4449	0.3873
Total weight of eight reps (g)	3.3342	3.1839	2.9906	3.6714	3.7413	3.0824	3.6611	3.474	3.5588	2.711
TSW (g)	4.1678	3.9799	3.7383	4.5893	4.6766	3.8530	4.5764	4.3425	4.4485	3.3888
Average TSW (g)	4.176	St.Dev:	0.427							
Recommended TSW (g)		5.029	5.000							
2500 seed weight (g)	12.5	12.5 g								
25000 seed weight (g)	125.0	125 g								
Number of seeds/gram	239									
Number of seeds/Ounce	6789									

Table 1: Weight (grams) of eight 100 pure seed unit replicates of ten seed lots from two varieties harvested in multiple years of *Bromus riparius* × *B. inermis,* hybrid bromegrass.

### **References:**

- 1. Coulman, B. 2004. Le brome hybride Knowles. Can. J. Plant Sci. 84: 815–817
- 2. Coulman, B. 2006. Success hybrid bromegrass. Can. J. Plant Sci. 86: 745–747
- 3. Association of Official Seed Analysts (AOSA), 2019. AOSA Rules for Testing Seeds.
- 4. International Seed Testing Association (ISTA), 2021, International Rules for Testing Seeds.

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