

Rule Change Proposal - 9

Purpose: To amend the seed unit description for *Hordeum vulgare*, barley, addressing commonly encountered damaged seed units and attempt to harmonize a closely as possible with the ISTA Rules, Federal Seed Act Regulations and CFIA Methods and Procedures.

Present and proposed rule: (proposed wording in blue text)

Table 2.4 Weights for working samples.

Pure Seed Unit #	Kind of seed	Minimum weight for purity analysis ^a	Minimum weight for noxious-weed seed or bulk examination	Approximate number of seeds per gram ^b	Approximate number of seeds per ounce ^c
		Grams	Grams	Number	Number
14	<i>Hordeum vulgare</i> L. subsp. <i>vulgare</i> barley	100	500	30	850

Table 3A. Pure seed unit definitions

PSU Number	Description of Pure Seed Unit
14	<p>Multiple floret spikelet, multiple floret, or floret, with or without awn(s), provided a caryopsis with some degree of endosperm development can be detected (either by slight pressure or by examination over light), see special consideration for <i>Hordeum vulgare</i>.</p> <p>Caryopsis or piece of broken caryopsis larger than one-half of the original size.</p> <p>Special consideration</p> <p>For <i>Hordeum vulgare</i>:</p> <ul style="list-style-type: none"> • A piece of broken floret or spikelet shall contain a caryopsis larger than one-half the original size. • Two or more attached spikelets shall be separated into single spikelets. • Attached rachis segments shall be removed and classified as inert matter.

Harmonization and impact statement: This species is included in the Federal Seed Act Regulations (FSA), the Canadian Food Inspection Agency Methods and Procedures for Testing Seeds (CFIA M&P), and the International Seed Testing Association Rules for Seed Testing (ISTA Rules); however, all three define pure seed units slightly differently. These differences will be detailed in the supporting evidence.

Supporting evidence:

The problem

Seed units commonly encountered in samples of *Hordeum vulgare*, barley, include spikelets, groups of spikelets, florets, broken florets and spikelets, and on rare occasion naked caryopses. The current AOSA PSU definition allows for all of these items except for spikelet groups, and attached rachis segments are not considered part

of the pure seed unit (i.e., they must be removed and classified as inert matter). By definition, all spikelets and florets must contain a caryopsis with some degree of endosperm, and broken caryopses must be larger than one-half the original size. The current PSU definition does not address what to do with broken florets and spikelets, so the question becomes do we evaluate these items based on whether they are larger than one-half the original size, or do we evaluate these items based on whether they have a caryopsis with some degree of endosperm. If we use the later, then we run the risk of potentially classifying very small fragments of florets and spikelets as pure seed simply because they have some trace amount of endosperm present.

How do other sets of seed testing procedures deal with barley?

The FSA allows for multiple florets and spikelets containing caryopses with some degree of endosperm. There is no mention of what to do with broken caryopses. Barley is excluded from kinds allowed to have seed units of spikelet groups, or seed units with attached rachis segments.

The ISTA Rules allow for florets with lemma and palea enclosing a caryopsis, with or without awn or with or without rachis segment, irrespective of their length, broken florets that requires a broken floret to contain a caryopsis larger than one-half the original size, and caryopses that are either whole or broken pieces larger than one-half the original size.

The CFIA M&P allows for broken florets or free caryopses, provided they are larger than one-half the original size, entire florets and one-seeded spikelets with an obvious caryopsis containing endosperm, but attached sterile florets and basal appendages must be removed and classified as inert matter.

Recommended solution

This proposal is a compromise that will allow for broken florets and spikelets to be evaluated based on whether the caryopsis is present and larger than one-half the original size (similar to the ISTA Rules and the CFIA M&P), separates attached spikelets (similar to the FSA), and reinforces the requirement to remove the attached rachis segments (current AOSA Rules, the CFIA M&P, and the FSA).

Currently, the spikelet is the seed unit for barley and the rachis segment, which is not part of the spikelet, is required to be removed (see sec. 3.2e). Therefore, the proposal is not a change in classification, simply a clarification of the existing PSU definition for this species and adds directions for what to do with broken seed units and what to do with two or more spikelets that are attached together. There are usually three spikelets per node in *Hordeum vulgare*, and each spikelet has two elongated awn-like glumes. Although these may be removed during seed conditioning, all may not be completely removed. By current PSU definition, the glumes may remain attached as part of the pure seed unit (because glumes are part of a spikelet), this remains unchanged.

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2010 Rules Change Proposal – 9 – Update *Hordeum vulgare* PSU