2016 AOSA Rules Change Proposal 14

PURPOSE OF PROPOSAL: To add the Seedling Evaluation Handbook Committee's proposed changes to the lettuce section of Volume 4. The proposal is to add: a seedling with yellow cotyledons in a test with predominately green cotyledons as abnormal and note #8 to further clarify the use of the 50% rule. The rest of the changes are housekeeping, to add missing descriptions for abnormal seedlings and harmonize with the rest of the AOSA Rules Volume 4, Seedling Evaluation.

PRESENT AND PROPOSED RULE: AOSA Rules for Testing Seeds, Volume 4. The proposed changes are shown in red font on the page with the present rule, as follows.

HARMONIZATION STATEMENT: The proposed changes harmonize with the ISTA Handbook on Seedling Evaluation (section 15). The one proposed change that is not described in the Canadian Methods and Procedures is the abnormal classification of a seedling with yellow cotyledons (section 4.14.2). The proposed change that is not described in the Federal Seed Act is the abnormal classification of a seedling with yellow cotyledons (201.56-2).

SUPPORTING EVIDENCE: The revised lettuce evaluation guidelines in this proposal are the result of prolonged discussion and work of the Germination Committee and the Seedling Evaluation Handbook Committee's work on the Asteraceae Sunflower Family 1. A comparison was made of the AOSA Rules, ISTA Rules, Canada Methods and Procedures and the Federal Seed Act.
Virtual Lettuce Referee 2013:
https://d3n8a8pro7vhmx.cloudfront.net/aosa/pages/40/attachments/original/1408323405/2013_VirtualLettuceReferee.pdf?1408323405

SUBMITTED BY: Seedling Evaluation Handbook Lettuce Committee

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References:
AOSA Seedling Evaluation Handbook
ISTA Handbook on Seedling Evaluation
Canadian Methods and Procedures
Federal Seed Act

ASTERACEAE, SUNFLOWER FAMILY I - Lettuce

Lactuca sativa, lettuce

GENERAL DESCRIPTION

Seedling type: Epigeal dicot.

Food reserves: Cotyledons that expand and become thin, leaf-like and photosynthetic. Some varieties develop elongated petioles at the base of the cotyledons.

Shoot system: The hypocotyl elongates and carries the cotyledons above the soil surface. The epicotyl usually does not show any development within the test period.

Root system: A long primary root.

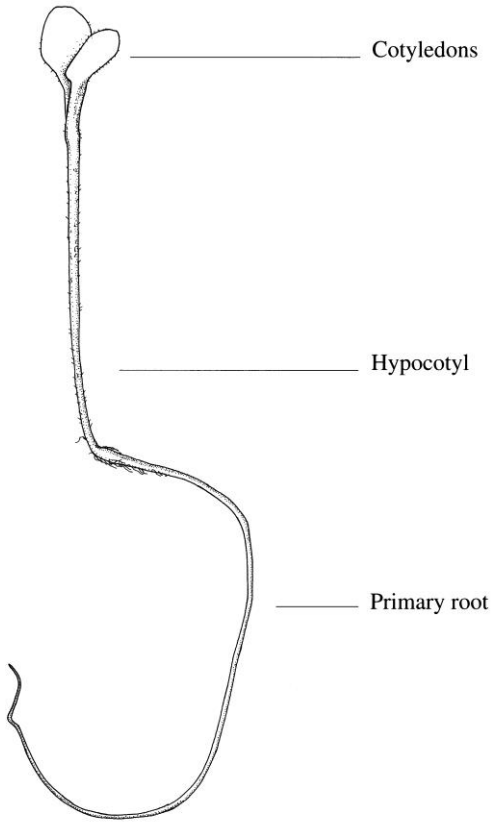


Fig. 1 Lettuce.

ABNORMAL SEEDLING DESCRIPTION

Cotyledons

- less than half of the original cotyledon tissue remaining attached.
- less than half of the original cotyledon tissue free of necrosis or decay (see notes 5 and 6).
- cotyledons that are swollen, curled, deformed.

Epicotyl

- missing (may be assumed to be present if cotyledons are intact).
- any degree of necrosis, decay or damage to the point of attachment.

Hypocotyl

- deep open cracks extending into the conducting tissue.
- severely twisted or grainy.
- watery.
- malformed, such as markedly shortened, curled or thickened.

Root

- none.
- primary root tip blunt, swollen and discolored.
- primary root with splits or lesions.
- weak, stubby or missing primary root (secondary roots will not compensate for a defective primary root).

Seedling

- swollen cotyledons associated with extremely short hypocotyl and root.
- one or more essential structures impaired as a result of decay from primary infection.
- albino or yellow.

NOTES

1. Toxic materials in the substrate will cause short, blunt roots. The roots lift away from the substrate. Check media for toxicity. Conduct retest if necessary on alternate approved media.

2. Seedlings grown on top of white filter paper will be shorter than those grown on ~~blue~~ colored blotters. Retest if necessary.

3. Remove attached seed coats for seedling evaluation.

4. Seedlings with slight dormancy or light sensitivity may be slow to germinate. Extend test according to the rules.

5. One type of necrosis on lettuce cotyledons is a physiological breakdown of the plant tissues, the cause of which has not been determined. It is manifested by discolored areas on the cotyledons, first appearing on or adjacent to the midrib and lateral veins, and should not be confused with the natural pigmentation of the different lettuce cultivars.

6. Seedlings with extensive physiological necrosis on the cotyledons may be slower in growth than those without such affected areas. Hypocotyl and root length may be affected by other factors such as proximity to light, delayed germination or dormancy.

7. Seedlings with three cotyledons should be considered as normal.

8. The 50% rule must be followed to classify seedlings with damaged cotyledons (dark areas of discoloration or decay) as either normal or abnormal.

2a. Grainy hypocotyl.

2b. Shortened hypocotyl.

2c. No hypocotyl development, stubby root.

2d. Physiological necrosis. See figure 3.

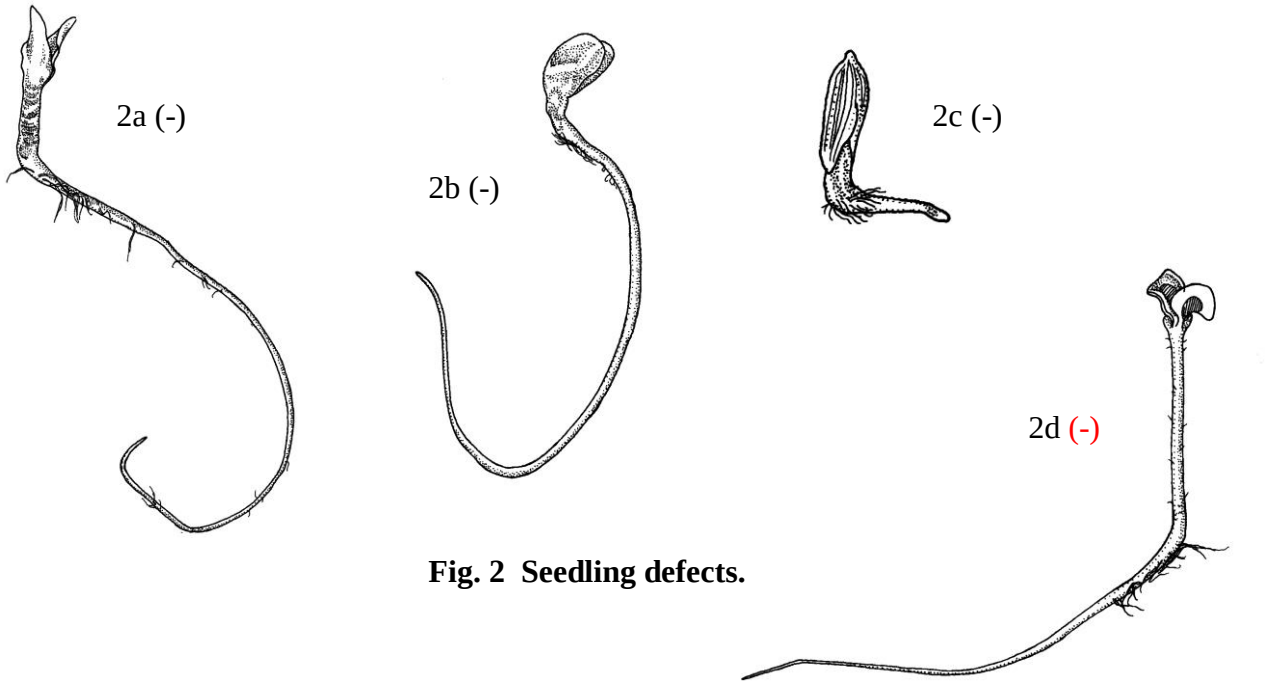
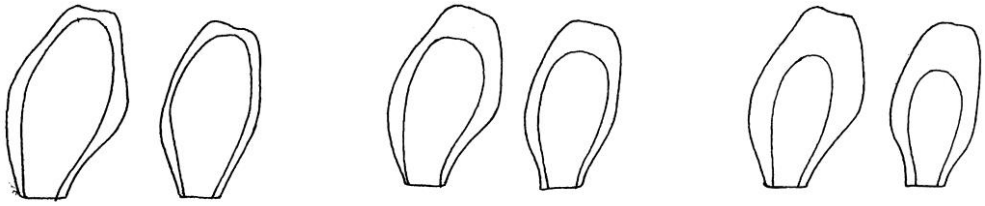


Fig. 2 Seedling defects.

Fig. 3 Physiological necrosis of lettuce cotyledons.



3a (-) 3b (-) 3c (+)

3a. Cotyledons 65% necrotic.

3b. Cotyledons 50% necrotic.

3c. Cotyledons 35% necrotic.