

2022 Rule Proposal #19

1. PURPOSE OF PROPOSAL: The current seedling evaluation section for ‘Apiaceae, Carrot Family’ in the Rules, vol. 4, does not include any illustrated examples of various normal and abnormal seedling conditions. The purpose of this proposal is to add example sketches as an aid to uniform seedling evaluation of Apiaceae. No changes are proposed to the text of this section or any evaluation guidelines.

2. PRESENT RULE:

APIACEAE, CARROT FAMILY

Anethum graveolens, dill

Anthriscus cerefolium, chervil

Apium graveolens, celery and celeriac

Carum carvi, caraway

Coriandrum sativum, coriander

Cuminum cyminum, cumin

Daucus carota subsp. *carota*, Queen Anne’s lace

Daucus carota subsp. *sativus*, carrot

Foeniculum vulgare, fennel

Pastinaca sativa, parsnip

Petroselinum crispum, parsley

Pimpinella anisum, anise

Trachymene coerulea, blue lace flower

GENERAL DESCRIPTION

Seedling type: Epigeal dicot.

Food reserves: Endosperm that is fleshy and firm; long, narrow cotyledons that become leaf-like and photosynthetic.

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, slender primary root.

ABNORMAL SEEDLING DESCRIPTIONS

Cotyledons

- less than half of the original cotyledon tissue remaining attached.
- less than half of the original cotyledon tissue free of necrosis or decay.

Epicotyl

- missing (may be assumed to be present if cotyledons are intact).

Hypocotyl

- decayed at point of attachment.
- deep open cracks extending into the conducting tissue.
- malformed, such as markedly shortened, curled or thickened.
- watery.

Root

- weak, stubby or missing primary root (secondary roots will not compensate for a defective primary root).

Seedling

- one or more essential structures impaired as a result of decay from primary infection.
- albino.

NOTES

1. Seed units in the Apiaceae may be schizocarps (two-seeded) or mericarps (one-seeded). Frequent counts should be made on schizocarps, since growing seedlings will separate. Any schizocarp that produces at least one normal seedling is classified as normal; only one seedling per schizocarp is to be counted.

REFERENCES

Wellington, P.S. 1970. Evaluation of seedlings of the Umbelliferae. Proc. Int. Seed Test. Ass. Vol. 35(2):591-597.

3. PROPOSED RULE:

The proposed Rule starts on page 3 of this document. Proposed text is in red, while proposed sketches are presented as original black and white drawings.

All sketches were drawn by Dr. Albre Brown.

APIACEAE, CARROT FAMILY

Anethum graveolens, dill
Anthriscus cerefolium, chervil
Apium graveolens, celery and celeriac
Carum carvi, caraway
Coriandrum sativum, coriander
Cuminum cyminum, cumin
Daucus carota subsp. *carota*, Queen Anne's lace

Daucus carota subsp. *sativus*, carrot
Foeniculum vulgare, fennel
Pastinaca sativa, parsnip
Petroselinum crispum, parsley
Pimpinella anisum, anise
Trachymene coerulea, blue lace flower

GENERAL DESCRIPTION

Seedling type: Epigeal dicot.

Food reserves: Endosperm that is fleshy and firm; long, narrow cotyledons that become leaf-like and photosynthetic.

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, slender primary root.

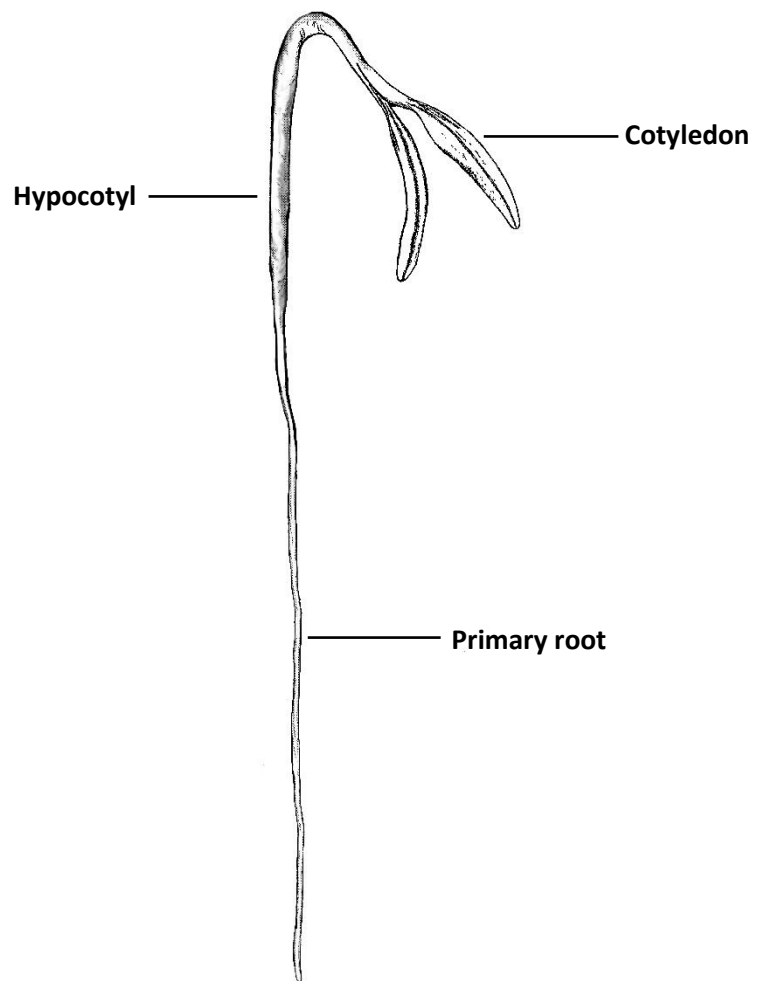


Figure 1. Normal carrot seedling.

ABNORMAL SEEDLING DESCRIPTIONS

Cotyledons

- less than half of the original cotyledon tissue remaining attached.
- less than half of the original cotyledon tissue free of necrosis or decay.

Epicotyl

- missing (may be assumed to be present if cotyledons are intact).

Hypocotyl

- decayed at point of attachment.
- deep open cracks extending into the conducting tissue.
- malformed, such as markedly shortened, curled or thickened.
- watery.

Root

- weak, stubby or missing primary root (secondary roots will not compensate for a defective primary root).

Seedling

- one or more essential structures impaired as a result of decay from primary infection.
- albino.

NOTES

4. Seed units in the Apiaceae may be schizocarps (two-seeded) or mericarps (one-seeded). Frequent counts should be made on schizocarps, since growing seedlings will separate. Any schizocarp that produces at least one normal seedling is classified as normal; only one seedling per schizocarp is to be counted.

REFERENCES

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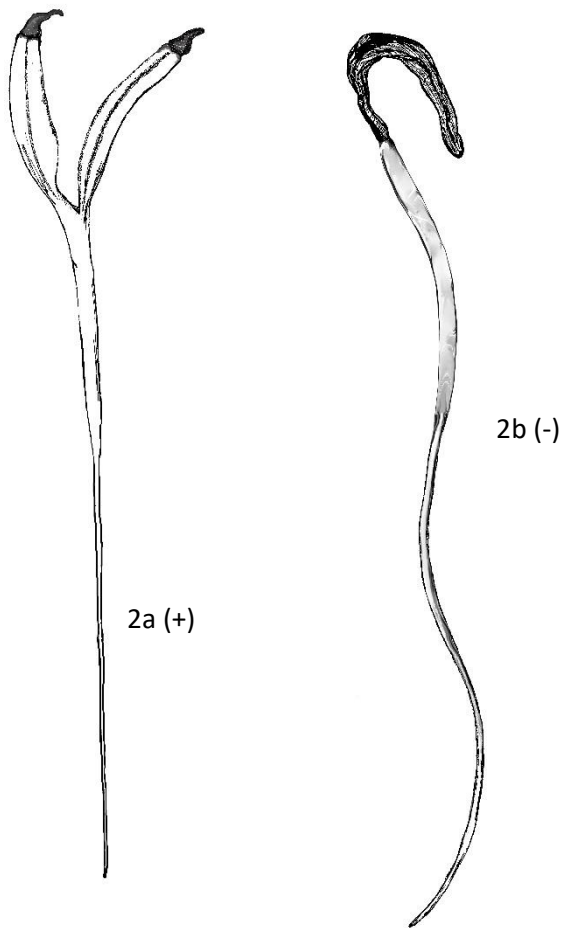


Fig. 2 Cotyledon defects.

2a. Normal seedling with more than half of the cotyledon tissue free of necrosis.

2b. Abnormal seedling with necrotic tissue extending from the cotyledon to the hypocotyl.

Fig. 3 Hypocotyl defects.

3a. Abnormal seedling with short, malformed hypocotyl.

3b. Abnormal seedling with decay at the hypocotyl-cotyledon juncture.

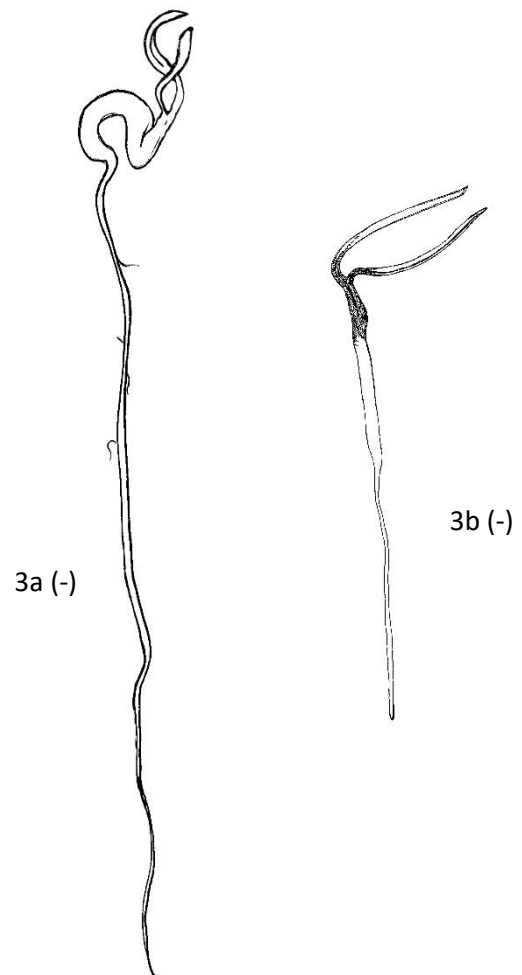
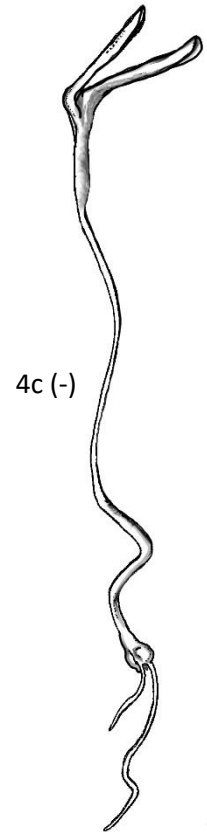
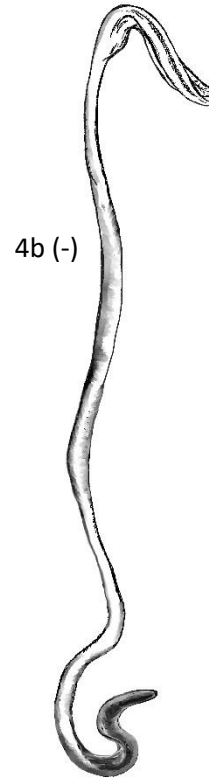
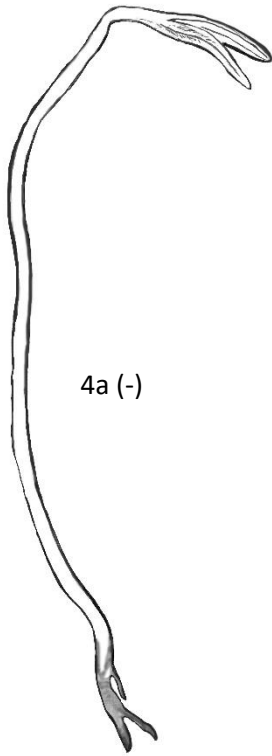


Fig. 4 Root defects.



- 4a. Abnormal seedling with short, necrotic primary root.
- 4b. Abnormal seedling with stubby, necrotic primary root.
- 4c. Abnormal seedling with missing primary root (secondary roots will not compensate for a defective primary root).
- 4d. Abnormal seedling with short, decayed primary root.

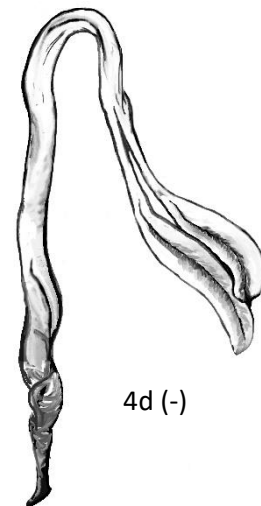


Fig. 5 Seedling defects.



5a. Normal late germinating seedling.

5b. Abnormal, watery, un-developed seedling.

4. HARMONIZATION AND IMPACT STATEMENT:

The proposed change will have no impact, positive or negative, on harmonization with ISTA Rules, the Federal Seed Act, or Canadian M&P.

5. SUPPORTING EVIDENCE:

~~N/A~~ All sketches in this proposal were based on pictures depicting different seedling conditions, as approved by the Germination Subcommittee back in 2010.

6. SUBMITTED BY:

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7. DATE SUBMITTED:

October 15, 2021