Agricultural Marketing Service, USDA § 201.56–5

(1) Germination habit: Epigeal dicot.
(2) Food reserves: Cotyledons which are large and fleshy; they expand, become photosynthetic, and usually persist beyond the seedling stage.
(3) Shoot system: The hypocotyl elongates and the cotyledons are pulled free of the seed coat, which often adheres to a peg-like appendage at the base of the hypocotyl. The epicotyl usually does not show any development within the test period.
(4) Root system: A long primary root with numerous secondary roots.

(b) Abnormal seedling description.
(i) Cotyledons:
(A) Less than half of the original cotyledon tissue remaining attached.
(B) Less than half of the original cotyledon tissue free of necrosis or decay. (Remove any attached seed coats at the end of the test period for evaluation of cotyledons.)

(ii) Hypocotyl:
(A) Missing. (May be assumed to be present if the cotyledons are intact.)

(iii) Epicotyl:
(A) Missing. (May be assumed to be present if the cotyledons are intact.)
(B) [Reserved]

(iv) Root:
(A) No leaf.
(B) Leaf extending less than halfway up into the coleoptile.
(C) Leaf extensively shredded or split.
(D) Grainy, spirally twisted, shredded, and weak.
(E) Deep open cracks in the mesocotyl.

(i) Seedling:
(A) Decayed at point of attachment to the scutellum.
(B) One or more essential structures impaired as a result of decay from primary infection.
(C) Albino.

(D) Endosperm obviously detached from the root-shoot axis (e.g. kernel lifted away by the growing shoot).
(E) Thickened and shortened roots and/or shoots.

(b) Rice.
(i) General description.
(A) Germination habit: Hypogeal monocot.

(ii) Food reserves: Endosperm. The scutellum is a modified cotyledon which is in direct contact with the endosperm. During germination the scutellum remains inside the seed to absorb nutrients from the endosperm and transfer them to the growing seedling.

(iii) Shoot system: The shoot consists of the coleoptile, leaves enclosed in the coleoptile, and the mesocotyl. The coleoptile elongates and pushes through the soil surface; the mesocotyl may elongate depending on the variety and light intensity, but may not be discernible. Splitting of the coleoptile occurs naturally as a result of growth and emergence of the leaves.

(iv) Root system: A primary root and seminal roots. The primary root is not readily distinguishable from the seminal roots; therefore, all roots arising from the seed are referred to as seminal roots.

(ii) Abnormal seedling description.
(A) Missing.
(B) No leaf.
(C) Leaf extending less than halfway up into the coleoptile.
(D) Leaf extensively shredded or split.
(E) Spindly or watery.
(F) Grainy, spirally twisted, shredded, and weak.
(G) Deep open cracks in the mesocotyl.

(i) Seedling:
(A) Decayed at point of attachment to the scutellum.
(B) One or more essential structures impaired as a result of decay from primary infection.
(C) Albino.

(D) Endosperm obviously detached from the root-shoot axis (e.g. kernel lifted away by the growing shoot).
(E) Thickened and shortened roots and/or shoots.

(b) Rice.
(i) General description.
(A) Germination habit: Hypogeal monocot.

(ii) Food reserves: Endosperm. The scutellum is a modified cotyledon which is in direct contact with the endosperm. During germination the scutellum remains inside the seed to absorb nutrients from the endosperm and transfer them to the growing seedling.

(iii) Shoot system: The shoot consists of the coleoptile, leaves enclosed in the coleoptile, and the mesocotyl. The coleoptile elongates and pushes through the soil surface; the mesocotyl may elongate depending on the variety and light intensity, but may not be discernible. Splitting of the coleoptile occurs naturally as a result of growth and emergence of the leaves.

(iv) Root system: A primary root and seminal roots. The primary root is not readily distinguishable from the seminal roots; therefore, all roots arising from the seed are referred to as seminal roots. 

§ 201.56–5 Grass family, Poaceae (Gramineae).

Kinds of seed: Bentgrasses, bluegrasses, bluestems, bromes, cereals, fescues, millets, orchardgrass, redtop, ryegrasses, sorgums, timothy, turf timothy, wheatgrasses, and all other grasses listed in § 201.2(h).

(a) Cereals: Agrotricum, barley, oat, rye, mountain rye, wheat, wheat×agrotricum, and triticale.

(i) General description.
(A) Germination habit: Hypogeal monocot.

(ii) Food reserves: Endosperm. The scutellum is a modified cotyledon which is in direct contact with the endosperm. During germination the scutellum remains inside the seed to absorb nutrients from the endosperm and transfer them to the growing seedling.

(iii) Shoot system: The shoot consists of the coleoptile, leaves enclosed in the coleoptile, and the mesocotyl. The coleoptile elongates and pushes through the soil surface; the mesocotyl may elongate depending on the variety and light intensity, but may not be discernible. Splitting of the coleoptile occurs naturally as a result of growth and emergence of the leaves.

(iv) Root system: A primary root and seminal roots. The primary root is not readily distinguishable from the seminal roots; therefore, all roots arising from the seed are referred to as seminal roots.

(ii) Abnormal seedling description.
(A) Missing.
(B) No leaf.
(C) Leaf extending less than halfway up into the coleoptile.
(D) Leaf extensively shredded or split.
(E) Spindly or watery.
(F) Grainy, spirally twisted, shredded, and weak.
(G) Deep open cracks in the mesocotyl.

(i) Seedling:
(A) Decayed at point of attachment to the scutellum.
(B) One or more essential structures impaired as a result of decay from primary infection.
(C) Albino.

(D) Endosperm obviously detached from the root-shoot axis (e.g. kernel lifted away by the growing shoot).
(E) Thickened and shortened roots and/or shoots.

(b) Rice.
(i) General description.
(A) Germination habit: Hypogeal monocot.

(ii) Food reserves: Endosperm. The scutellum is a modified cotyledon which is in direct contact with the endosperm. During germination the scutellum remains inside the seed to absorb nutrients from the endosperm and transfer them to the growing seedling.

(iii) Shoot system: The shoot consists of the coleoptile, leaves enclosed in the coleoptile, and the mesocotyl. The coleoptile elongates and pushes through the soil surface; the mesocotyl may elongate depending on the variety and light intensity, but may not be discernible. Splitting of the coleoptile occurs naturally as a result of growth and emergence of the leaves.

(iv) Root system: A primary root and seminal roots. The primary root is not readily distinguishable from the seminal roots; therefore, all roots arising from the seed are referred to as seminal roots.

(ii) Abnormal seedling description.
(A) Missing.
(B) No leaf.
(C) Leaf extending less than halfway up into the coleoptile.
(D) Leaf extensively shredded or split.
(E) Spindly or watery.
(F) Grainy, spirally twisted, shredded, and weak.
(G) Deep open cracks in the mesocotyl.

(i) Seedling:
(A) Decayed at point of attachment to the scutellum.
(B) One or more essential structures impaired as a result of decay from primary infection.
(C) Albino.

(D) Endosperm obviously detached from the root-shoot axis (e.g. kernel lifted away by the growing shoot).
(E) Thickened and shortened roots and/or shoots.

(b) Rice.
(i) General description.
(A) Germination habit: Hypogeal monocot.

(ii) Food reserves: Endosperm. The scutellum is a modified cotyledon which is in direct contact with the endosperm. During germination the scutellum remains inside the seed to absorb nutrients from the endosperm and transfer them to the growing seedling.

(iii) Shoot system: The shoot consists of the coleoptile, leaves enclosed in the coleoptile, and the mesocotyl. The coleoptile elongates and pushes through the soil surface; the mesocotyl may elongate depending on the variety and light intensity, but may not be discernible. Splitting of the coleoptile occurs naturally as a result of growth and emergence of the leaves.

(iv) Root system: A primary root and seminal roots. The primary root is not readily distinguishable from the seminal roots; therefore, all roots arising from the seed are referred to as seminal roots.

(ii) Abnormal seedling description.
(A) Missing.
(B) No leaf.
(C) Leaf extending less than halfway up into the coleoptile.
(D) Leaf extensively shredded or split.
(E) Spindly or watery.
(F) Grainy, spirally twisted, shredded, and weak.
(G) Deep open cracks in the mesocotyl.

(i) Seedling:
(A) Decayed at point of attachment to the scutellum.
(B) One or more essential structures impaired as a result of decay from primary infection.
(C) Albino.

(D) Endosperm obviously detached from the root-shoot axis (e.g. kernel lifted away by the growing shoot).
(E) Thickened and shortened roots and/or shoots.

(b) Rice.
(i) General description.
(A) Germination habit: Hypogeal monocot.

(ii) Food reserves: Endosperm. The scutellum is a modified cotyledon which is in direct contact with the endosperm. During germination the scutellum remains inside the seed to absorb nutrients from the endosperm and transfer them to the growing seedling.

(iii) Shoot system: The shoot consists of the coleoptile, leaves enclosed in the coleoptile, and the mesocotyl. The coleoptile elongates and pushes through the soil surface; the mesocotyl may elongate depending on the variety and light intensity, but may not be discernible. Splitting of the coleoptile occurs naturally as a result of growth and emergence of the leaves.

(iv) Root system: A primary root and seminal roots. The primary root is not readily distinguishable from the seminal roots; therefore, all roots arising from the seed are referred to as seminal roots.
which is in direct contact with the endosperm. During germination the scutellum remains inside the seed to absorb nutrients from the endosperm and transfer them to the growing seedling.

(iii) Shoot system: The shoot consists of the coleoptile, leaves enclosed in the coleoptile, and the mesocotyl. The coleoptile elongates and pushes through the soil or water surface; the mesocotyl may elongate depending on the variety and environmental conditions. Splitting of the coleoptile occurs naturally as a result of growth and emergence of the leaves.

(iv) Root system: Strong primary root and seminal roots. Adventitious roots may start to develop from the mesocotyl or coleoptilar node within the test period. If the mesocotyl elongates, the adventitious roots will be carried above the grain.

(2) Abnormal seedling description.

(i) Shoot:
(A) Missing.
(B) Thickened and shortened.
(C) No leaf.
(D) Leaf extending less than halfway up into the coleoptile.
(E) Leaf extensively shredded or split.
(F) Spindly or watery.
(G) Deep open cracks in the mesocotyl.

(ii) Root:
(A) Missing.
(B) Weak, stubby, or missing primary root with weak seminal roots.
(C) None.

(iii) Seedling:
(A) Decayed at point of attachment to the scutellum.
(B) One or more essential structures impaired as a result of decay from primary infection.
(C) Albino.

(d) Johnsongrass, sorghum, sorgrass, sorghum-album, sudangrass, and sorghum-sudangrass.

(1) General description.

(i) Germination habit: Hypogean monocot.

(ii) Food reserves: Endosperm. The scutellum is a modified cotyledon which is in direct contact with the endosperm. During germination the scutellum remains inside the seed to absorb nutrients from the endosperm and transfer them to the growing seedling.

(iii) Shoot system: The shoot consists of the coleoptile, leaves enclosed in the coleoptile, and the mesocotyl. The coleoptile elongates and pushes through the soil surface; the mesocotyl usually elongates. Splitting of the coleoptile occurs naturally as a result of growth and emergence of the leaves. A twisted and curled shoot bound by a tough seed coat may be considered normal, provided the shoot is not decayed.

(iv) Root system: Strong primary root and seminal roots. Adventitious roots may start to develop from the mesocotyl or coleoptilar node within the test period.

(2) Abnormal seedling description.

(i) Shoot:
(A) Missing.
(B) Thickened and shortened.
(C) No leaf.
(D) Leaf extending less than halfway up into the coleoptile.
(E) Leaf extensively shredded or split.
(F) Spindly or watery.
(G) Deep open cracks in the mesocotyl.

(ii) Root:
(A) None.
(B) Weak, stubby, or missing primary root with weak seminal roots.

(iii) Seedling:
(A) Decayed at point of attachment to the scutellum.
(B) One or more essential structures impaired as a result of decay from primary infection.
(C) Albino.

(c) Corn.

(1) General description.

(i) Germination habit: Hypogean monocot.
(iv) Root system: A long primary root. Secondary or adventitious roots may develop within the test period. Adventitious roots may start to develop from the mesocotyl or coleoptilar node within the test period. Areas of natural, reddish pigmentation may develop on the root.

(2) Abnormal seedling description.
(i) Shoot:
(A) Missing.
(B) Thickened and shortened.
(C) No leaf.
(D) Leaf extending less than halfway up into the coleoptile.
(E) Leaf extensively shredded or split.
(F) Spindly or watery.
(G) Deep open cracks in the mesocotyl.

(ii) Root:
(A) None.
(B) Damaged or weak primary root with less than two strong secondary roots.

(iii) Seedling:
(A) Decayed at point of attachment to the scutellum.
(B) One or more essential structures impaired as a result of decay from primary infection.
(C) Albino.

(e) Grasses and millets.
(i) General description.
(ii) Food reserves: Endosperm. The scutellum is a modified cotyledon which is in direct contact with the endosperm. During germination the scutellum remains inside the seed to absorb nutrients from the endosperm and transfer them to the growing seedling.

(iii) Shoot system: The shoot consists of the coleoptile, leaves enclosed in the coleoptile, and the mesocotyl. The coleoptile elongates and pushes through the soil surface. The mesocotyl may or may not elongate significantly, depending on the kind. Splitting of the coleoptile occurs naturally as a result of growth and emergence of the leaves.

(iv) Root system: A long primary root. Secondary or adventitious roots may develop within the test period. In certain kinds (e.g., bermudagrass) the primary root may not be readily visible because it is coiled inside the tightly fitting lemma and palea. At the time of evaluation, the glumes should be removed and the root observed. Such seedlings are classified as normal if the primary root has developed. For Kentucky bluegrass, a primary root \( \frac{1}{16} \) inch (1.6 mm) or more in length is classified as normal.

\( \text{§ 201.56–6} \)

Legume or pea family, Fabaceae (Leguminosae).

Kinds of seed: Alfalfa, alyceclover, asparagusbean, beans (Phaseolus spp.), Florida beggarweed, black medic, broadbean, burclovers, buttonclover, chickpea, clovers (Trifolium spp.), cowpea, crotalarias, crownvetch, guar, hairy indigo, kudzu, lentil, lespedeza, lupines, northern sweetvetch, peas, peanut, roughpea, sainfoin, sesbania, sourclover, soybean, sweetclovers, trefoils, velvetbean, and vetches.