



Designation: D 5539 – 94 (Reapproved 1998)

Standard Specification for Seed Starter Mix¹

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1. Scope

1.1 This specification covers the material characteristics, physical requirements, and sampling appropriate to the designation of a soil or soil-like material for seed starting purposes. This would consist of the duration of germination ending after the cotyledon stage (at the opening of the first true leaves).

1.2 Seed starter mix may include natural soils and artificial mixtures of natural or artificial materials used for the initial germination of seeds to the cotyledon stage.

2. Referenced Documents

2.1 ASTM Standards:

C 330 Specification for Lightweight Aggregates for Structural Concrete²

C 331 Specification for Lightweight Aggregates for Concrete Masonry Units²

D 653 Terminology Relating to Soil, Rock, and Contained Fluids³

D 2607 Classification of Peats, Mosses, Humus, and Related Products⁴

D 4531 Test Methods for Bulk Density of Peat and Peat Products³

E 11 Specification for Wire-Cloth Sieves for Testing Purposes²

3. Material and Manufacture

3.1 The success of a seed starter mix is measured in its ability to provide a germinating seed with certain basic needs, that are outlined as follows. A variety of materials, both natural and artificial, can be employed to provide the characteristics that will fill the need.

3.2 *Function*—A seed starter media provides a seed (seedling) with four basic needs:

3.2.1 Aeration to permit an exchange of gases between the emerging roots and the surrounding medium,

3.2.2 Adequate seed (seedling) to starter media contact to permit water to flow to the seed and seedling root. This function also relates to the media having a sufficient amount of

water retention to maintain the amount of moisture needed for plant use,

3.2.3 A surface that does not inhibit emergence. This relates to the media's ability to resist surface crusting, and

3.2.4 A bulk density that does not inhibit root elongation and proliferation.

3.3 *Material*—While one material may be able to provide all of the needs of a seed (seedling), a mixture of varying percentage of at least two of these materials has been found in practice to yield more consistent results over a wide range of management practices. Therefore, seed starters are generally mixtures of materials. The following is a list of materials that have been used as or in seed starter mixes:

3.3.1 *Vermiculite*—This is a natural mineral that has been treated with heat until it becomes porous. This material has the ability to hold a significant amount of water and still allow for excellent drainage. However, it does not provide for good seed-media contact.

3.3.2 *Sphagnum Peat Moss*—This is a natural accumulation of plant material decayed and decaying under anaerobic conditions, and meeting the specifications outlined in Classification D 2607. Industry-wide, this seems to be the one material that has no substitute.

3.3.3 *Perlite*—This is a volcanic ash that looks like small beads of plastic. Similar to vermiculite, it holds less water but provides more seed-media contact.

3.3.4 *Coarse Sand*—This is mineral soil material that passes through a No. 10 sieve but is retained on a No. 40 sieve. It provides good drainage and maintains friability.

3.3.5 *Expanded Shale, Clay, or Slate*—These are engineered materials that are structural grade, inert, porous lightweight aggregates with properties meeting the requirements of Specification C 330 and C 331. Because of their particle strength these aggregates do not consolidate after initial compaction and are thus free draining.

3.3.6 *Peat Humus and Other Peat Products*—This material is more highly decomposed than the sphagnum variety. It meets the specifications outlined in Classification D 2607. While it may be used in the mixture, it tends to compact easily.

3.3.7 *Composted Organic Materials*—This material has desirable nutrient qualities if the seedling is not to be transplanted; however, it has the same drawbacks as the peat humus. Other properties of this material may or may not be desirable depending on the organic parent material and the manner of composting.

¹ This specification is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.22 on Soil as a Medium for Plant Growth.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.08.

⁴ Discontinued; see 1992 *Annual Book of ASTM Standards*, Vol. 04.08.