G A R D E N I N G S E R I E S

Colorado
MASTER GARDENER

Plant Structures: Seeds

no. 7.708

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Line drawings by S. Johnson.

Outline. . .

A seed (mature ovule) is a miniature plant with a protective cover in a suspended state of development. Most seeds contain a built-in food supply called endosperm (orchid is an exception). The endosperm can be made up of proteins, carbohydrates or fats.

Function

- Propagation
- Feed
- Horticultural uses including:
  – feed, food and oil.

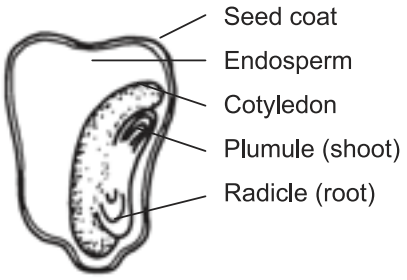

Figure 1. Monocot seed parts.

Structure and Emergence

Seeds of monocots and dicots differ in structure and method of emergence.

Monocot Seed Parts and Emergence

Seed coat – from the wall of the embryo sack (mother tissue).

Endosperm – food supply containing three sets of chromosomes (two from the mother and one from the father).

Embryo – immature plant.

Cotyledon – seed leaf.

Plumule – shoot.

Radicle – root.

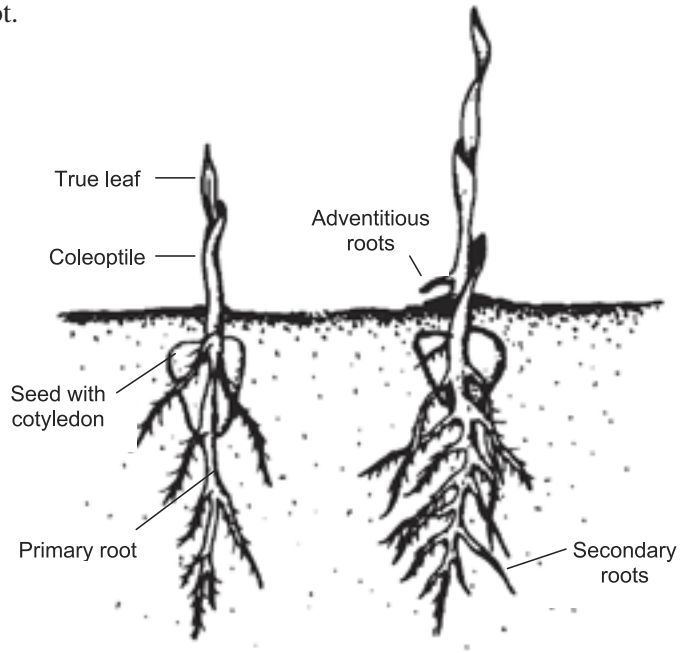

Figure 2. Emergence of a corn plant.

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Putting Knowledge to Work

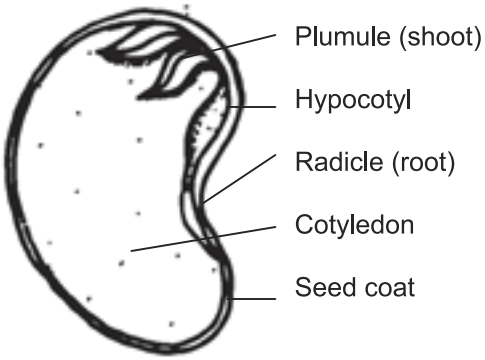

Figure 3. Dicot seed parts.

Dicot Seed Parts and Emergence

Seed coat – from embryo sack wall and endosperm tissue (During development, the endosperm stops dividing and is absorbed into the embryonic tissues.)

Embryo – immature plant

Cotyledon – food storing seed leaf

Plumule – shoot

Hypocotyl – stem

Radicle – root

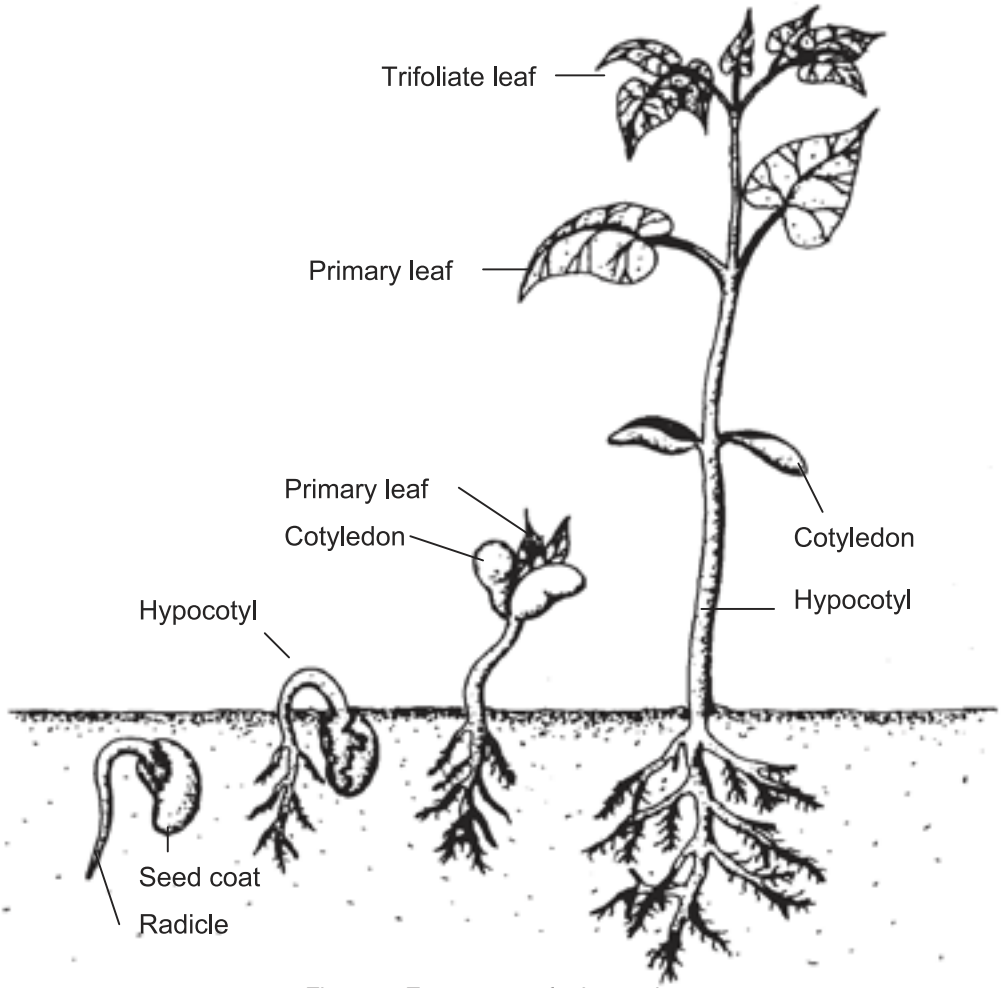

Figure 4. Emergence of a bean plant.

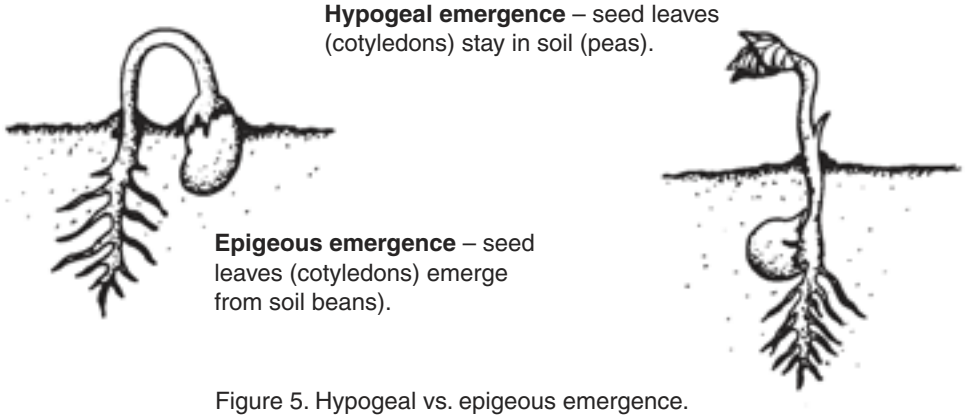

Figure 5. Hypogeal vs. epigeous emergence.

Seed Growth and Development Terms

Dormancy – state of suspended growth to survive adverse conditions and aid in dispersion. Adapting plants to a variety of hostile environments, Mother Nature programs a variety of germination blocks. The following are common types.

Seed coat dormancy – when the seed coat is impermeable to water and gases (oxygen). Requires action by weathering, microorganisms, passage through an animal's digestive track or fire to soften the seed coat.

Embryo dormancy – due to physiological conditions or germination blocks in the embryo itself. Requires a specific period of cold (or heat) with available moisture and oxygen. Embryo dormancy is common in woody plants.

Double dormancy – condition of both seed coat and embryo dormancy.

Rudimentary embryo dormancy – situation where the embryo is immature and requires a growth period before it can germinate.

Chemical inhibitor dormancy – seed contains some type of chemical that blocks germination. Many desert plants contain chemical germination inhibitors that are leached out in a soaking rain.

Stratification – techniques used by a horticulturist to overcome dormancy.

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