



MASTER GARDENER
COLORADO STATE UNIVERSITY
EXTENSION

CMG GardenNotes #137

Plant Structures: Seeds

Outline: Function, page 1
 Structure, page 1
 Monocots, page 1
 Dicots, page 2
 Seed growth and development terms, page 2

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
 - o Feed, food and oil

Structure and Emergence

Seeds of monocots and dicots differ in structure.

Monocot Seeds

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

Endosperm – Food supply containing 3 sets of chromosomes (2 from the mother and 1 from the father)

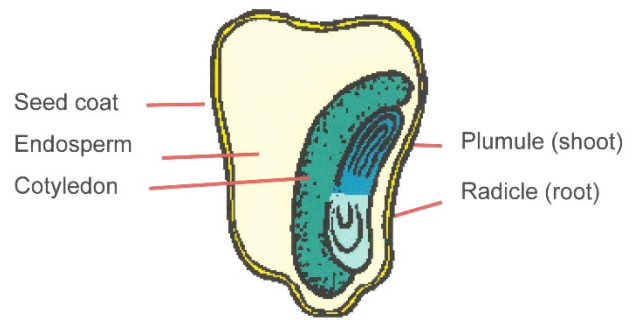
Embryo – Immature plant

Cotyledon – Seed leaf

Plumule – Shoot

Radicle – Root

Figure 1. Cross section of monocot seed (corn).



Dicot Seeds

Seed coat – The protective outer covering of a seed.

Embryo – Immature plant

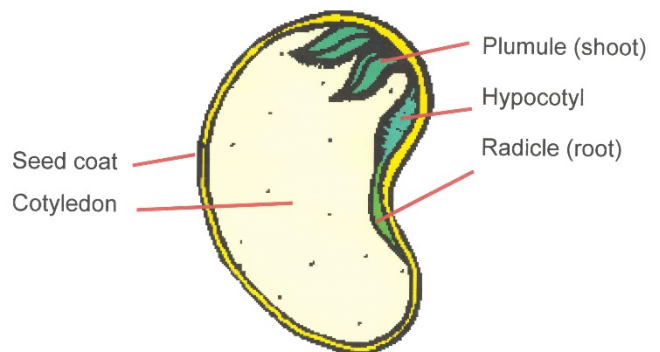
Cotyledon – Food storing seed leaf

Plumule – Shoot

Hypocotyl – Stem

Radicle – Root

Figure 3. Cross section of dicot seed (bean).



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, 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). It 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. It 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.

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.

Germination – Sprouting of seed following exposure to correct environmental conditions for the species

Stratification – Techniques used to overcome dormancy.

Authors: David Whiting, Consumer Horticulture Specialist (retired), Colorado State University Extension; with Michael Roll and Larry Vickerman (former CSU Extension employees). Line drawings by Scott Johnson and David Whiting. Revised by Patti O'Neal, Roberta Tolan and Mary Small, CSU Extension.

- Colorado Master Gardener *GardenNotes* are available online at www.cmg.colostate.edu.
- Colorado Master Gardener training is made possible, in part, by a grant from the *Colorado Garden Show, Inc.*
- Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating.
- Extension programs are available to all without discrimination.
- No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.
- Copyright Colorado State University Extension. All Rights Reserved. *CMG GardenNotes* may be reproduced, without change or additions, for nonprofit educational use with attribution.

Revised May 2016