

GardenNotes #137

## Plant Structures: Seeds

---

Outline: Function, page 1  
Structure, page 1  
    Monocots, page 1  
    Dicots, page 2  
Seed growth and development terms, page 3

---

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 and method of emergence.

#### Monocot Seeds

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

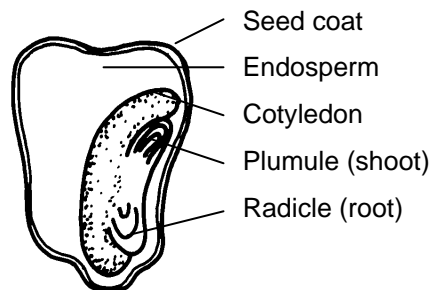
**Endosperm** – food supply containing 3 sets of chromosomes (2 from the mother and 1 from the father)

**Embryo** – immature plant

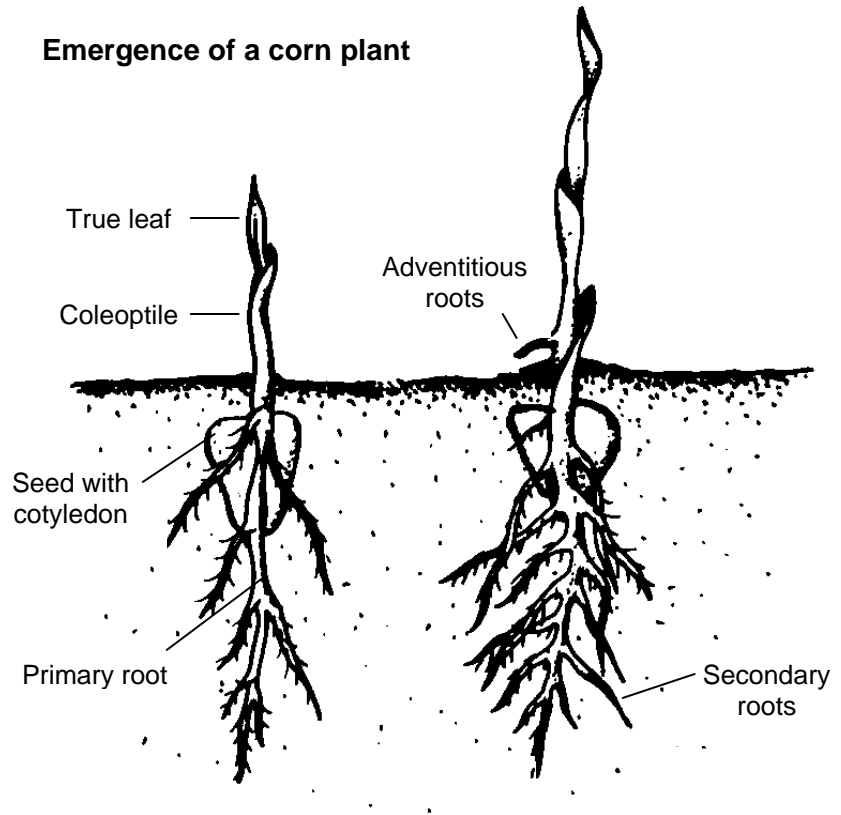
**Cotyledon** – seed leaf

**Plumule** – shoot

**Radicle** – root

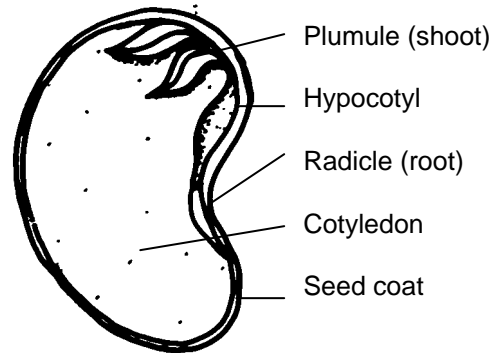


## Emergence of a corn plant



## Dicot Seeds

**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

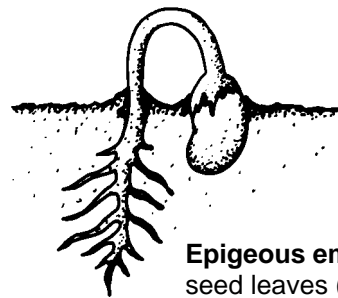
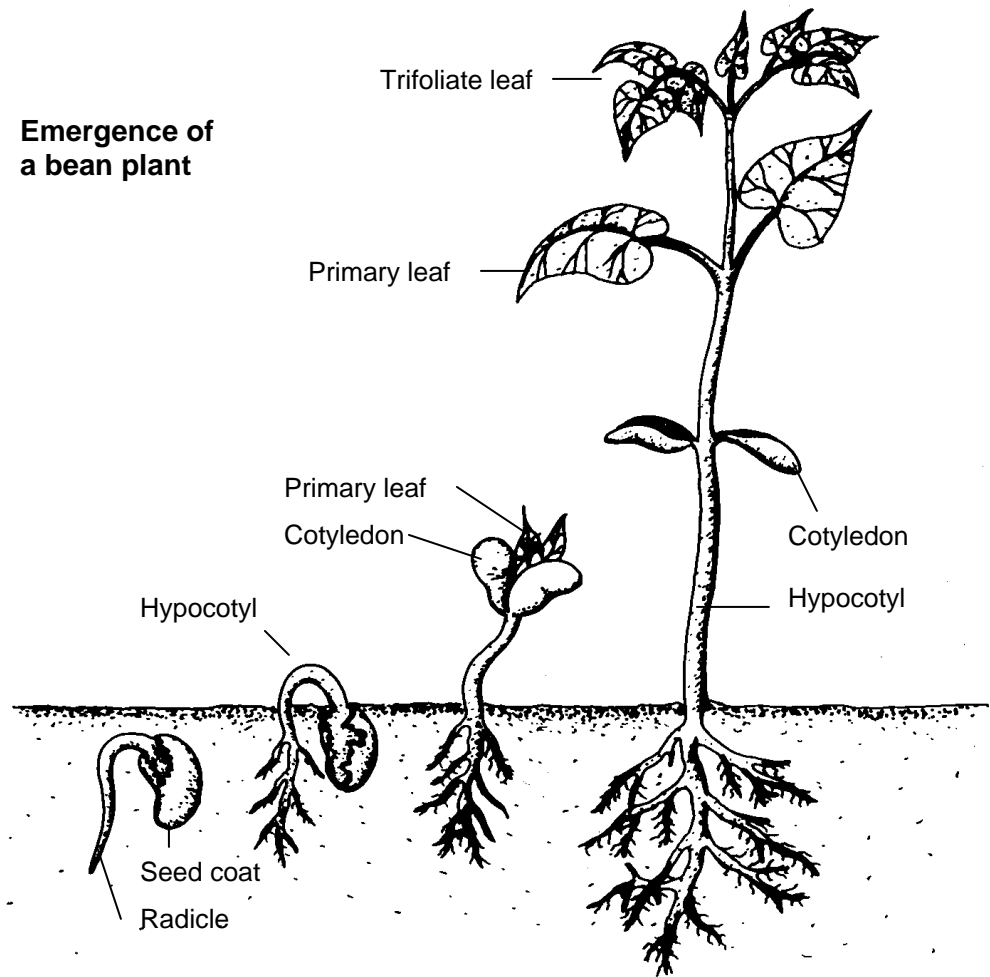
**Cotyledon** – food storing seed leaf

**Plumule** – shoot

**Hypocotyl** – stem

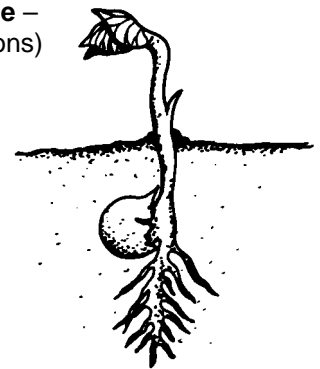
**Radicle** – root

**Emergence of a bean plant**



**Epigeal emergence** – seed leaves (cotyledons) emerge from soil -- beans

**Hypogeal emergence** – seed leaves (cotyledons) stay in soil – peas



**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). 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.

**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.

**For details on dormancy, stratification and germination of any specific plant, refer to a book on plant propagation.**

### **Additional Information** – *CMG GardenNotes* on How Plants Grow (Botany):

#121	Horticulture Classification	#136	Plant Structures: Fruit
#122	Taxonomy	#137	Plant Structures: Seeds
#131	Plant Structures: Cells, Tissues, and Structures	#141	Plant Growth: Photosynthesis, Respiration and Transpiration
#132	Plant Structures: Roots	#142	Plant Growth: Light
#133	Plant Structures: Stems	#143	Plant Growth: Temperature
#134	Plant Structures: Leaves	#144	Plant Growth: Water
#135	Plant Structures: Flowers	#145	Plant Growth: Hormones

---

Authors: David Whiting, Colorado State University Cooperative Extension; Michael Roll and Larry Vickerman (former CSU employees). Line drawings by Scott Johnson

- o Colorado Master Gardener *GardenNotes* are available on-line at [www.cmg.colostate.edu](http://www.cmg.colostate.edu).
- o Colorado Master Gardener training is made possible, in part, by a grant from the *Colorado Garden Show, Inc.*
- o Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating.
- o Extension programs are available to all without discrimination.
- o No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.
- o Copyright 2003-2007. Colorado State University Extension. All Rights Reserved. *CMG GardenNotes* may be reproduced, without change or additions, for non-profit educational use.

Revised June 2007

