

CASE

*Curriculum for Agricultural
Science Education*

Principles of Agricultural Science – Plant

Germination Requirements

Unit 7 Plant Reproduction
Lesson 7.3 Kernels of Life

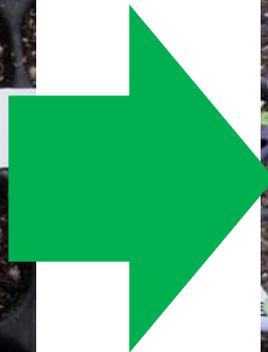
Germination Defined

Sprouting of a seed, and beginning of plant growth.



Germination Rate

The number of seeds that are likely to germinate under proper conditions.
Allows calculation of the number seeds required to establish a target population.



Germination Rate (Continued)

Usually expressed as a percentage

Example:

85% germination rate =
85 out of 100 seeds
will germinate under
proper conditions



Influences of Germination Rate



Physiological factors – developmental stages and degradation of seed:

- Age of seed
- Maturity or health of parent plant

Environmental factors – critical factors for germination:

- Water
- Temperature
- Oxygen
- Light

Age of the Seed



Many seeds have a “shelf life”

Examples:

- a bean seed with a 3-year life expectancy
- a pigweed seed with over a 40-year life expectancy

Maturity and Health of Parent Plant



- A young immature plant forced into early seed production may produce weak seeds.
- Other health issues, such as stress from drought may also influence seed viability.

Water



- ❧ The seed swells when it absorbs water and will aid the embryo in pushing through the hard seed coat.

- ❧ Seeds need water to soften the seed coat that protected the embryo during dormancy.



Water (Continued)

- ❧ Water is necessary for cell growth. Cells enlarge and multiply very rapidly during germination.
- ❧ Water is also essential for translocation of nutrients throughout the embryonic tissues.

Temperature

- ✎ Plants have specific temperature ranges for optimal germination.
- ✎ The range of temperature will depend upon whether the plant is a cool-season or warm-season species.

Oxygen

-  Everything living needs oxygen – active or dormant.
-  A common problem in germination is too much water that saturates the soil depriving oxygen to the embryo.

Light

- 💡 A few species require their seeds to be exposed to light for a short duration of time prior to germinating.

Example – lettuce and pigweed

References



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