Growing from Seed

What is a seed?
- matured ovule

What is a fruit?
- matured ovary

What is the purpose of seeds?
- variability of offspring
- dispersal of offspring away from parent
- survival of plant through difficult conditions

How is growing from seed different?
- variability of seed-propagated plants

Advantages?
- easy
- little equipment
- lots of plants!

Disadvantages?
- variability!
- viability
- germination?

The purpose of flowering is to produce seeds

Seed production is the goal!

Fertilization

- Pollen grains
- Pollen tube
- Ovary
- Ovule
Embryo: develops from union of egg and sperm
Radicle: embryonic root
Epicotyl/hypocotyl: embryonic shoot
Endosperm: oil and carbohydrate storage
Seed Coat: mostly dead, hard tissue
  ➢ Protection from being crushed

Seed Dormancy
Prevents germination under poor conditions
Caused by:
1. hard seed coat
2. immature embryo
3. chemical inhibitors in seed and fruit

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Dormancy is rare in domesticated species
Wild-collected seed may require pre-treatment

Overcoming Dormancy
➢ Annual plants: temperature most important
  In other plants...
    Time (2):
      ➢ embryo maturity
      ➢ warm/cold/moisture
    Stratification (1,3)
      ➢ cold/moisture
    Scarification (1)
      ➢ breaking seed coat

Stratification
Usually 60-90 days
35-40°F, moist
Protect from critters!
**Scarification**
Artificially breaking down the seed coat

**Mechanical**

**Hot water**
- Put in $\sim 200^\circ F \ H_2O$
- Allow to soak overnight
- Sow soon, keep moist

**Germination**

Conditions for germination:
- **Light**
  - light requirement
  - no light requirement
- **Moisture**
  - increase in seed size
- **Temperature**
  - varies widely
- **Oxygen**
  - frozen, compacted, or waterlogged soil

**Germination occurs as the result of:**
- swelling of the endosperm
- rupture of seed coat by emerging root
- emergence of the shoot

**Germination aids**

- **Hormonal**
  - Gibberellic acid: GA3
- “Instant smoke”

**Collecting Garden Seeds**

“hybrid” seed no good

- **Time of ripeness**
  - usually autumn

- **Pick before the critters**
  - fleshy fruits
  - “nut-like” seeds
  - dry capsules
  - conifers

- **Clean and dry seed as soon as possible**
Cleaning seeds

Fruit may inhibit the germination process

Sugar content of fruit
- Inhibits H₂O uptake

Chemical inhibition

Viability and storage

Seeds with thin coats lose viability quickly

Nut-like seeds lose viability quickly, too
- Horsechestnut, chestnut, oak, walnut

Temperature:
- Best is 30-40°F

Humidity:
- should be low
- store in sealed containers for long term

Seed viability test

Priming seed

“convinces” seed that moisture conditions o.k.
4 hours is usually sufficient to imbibe seed

Discard water

Not beans/corn!

Seed media selection

- Minimum 3” deep pot
- Seeding density

Annuals:
- Commercial mix

Wild seed:
- 2 parts peat/coir
- 1 part perlite (grit)
- Longer germination
Seed media selection
Mosses and liverworts love moisture/acidity
Growing under plastic or in shade is worse

Short germination time
- pretreatment

Place pots in bright window

Light systems
- Avoid incandescent
- 'Cool white' fluorescent

Transplanting
Annuals/perennials when large enough to handle
- minimizes growth reduction

Trees/shrubs/bulbs: less important
- sow thinly, liquid feed, transplant after 2-3 yrs?

- handle by leaves
- lift from under root
- avoid "J" root
- root pruning

Hang lights low
Remove covers after germination
Do not “J” root transplants...

Prune excessively long roots...

Resources

OSU Extension Service Publications
http://extension.oregonstate.edu/catalog/

PNW 170 Propagating plants from seed

FS 220 Collecting and storing seeds from your garden

Most complete reference for seed

Resources

Practical woody plant propagation for nursery growers

Garden Flowers from seed

American Hort Society Plant propagation

The reference manual of woody plant propagation