

Home Gardening Seed Starting Considerations



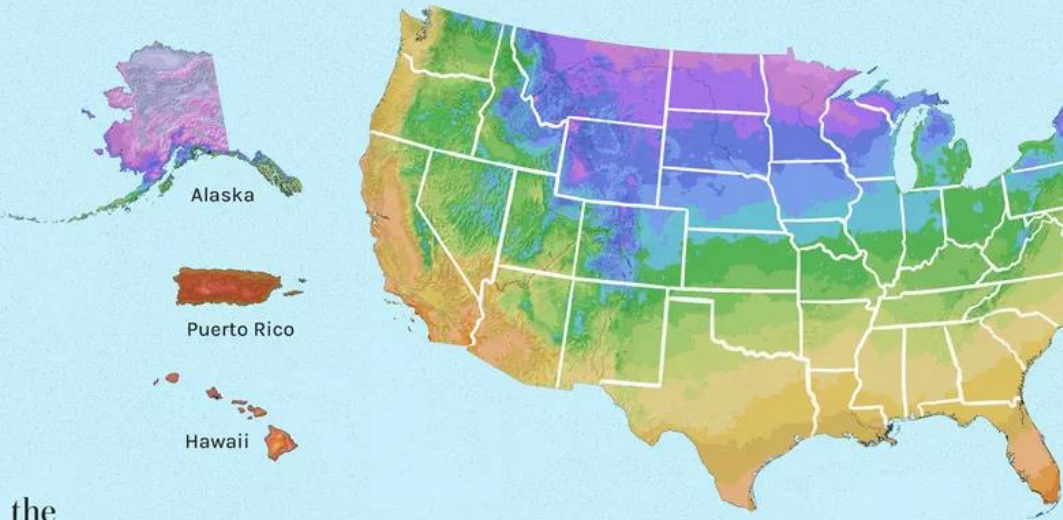
Table of Content

- Plant Hardiness Zones
- Potting Soil
- Trays and/or Pots
- Covers
- Grow Lights
- Heating Mats
- Tools
- Damping Off
- Outdoor Hardening Off Set Up
- Acknowledgements

Plant Hardiness Zones

USDA Plant Hardiness Zone Map

AVERAGE ANNUAL EXTREME MINIMUM TEMPERATURE 1976-2005

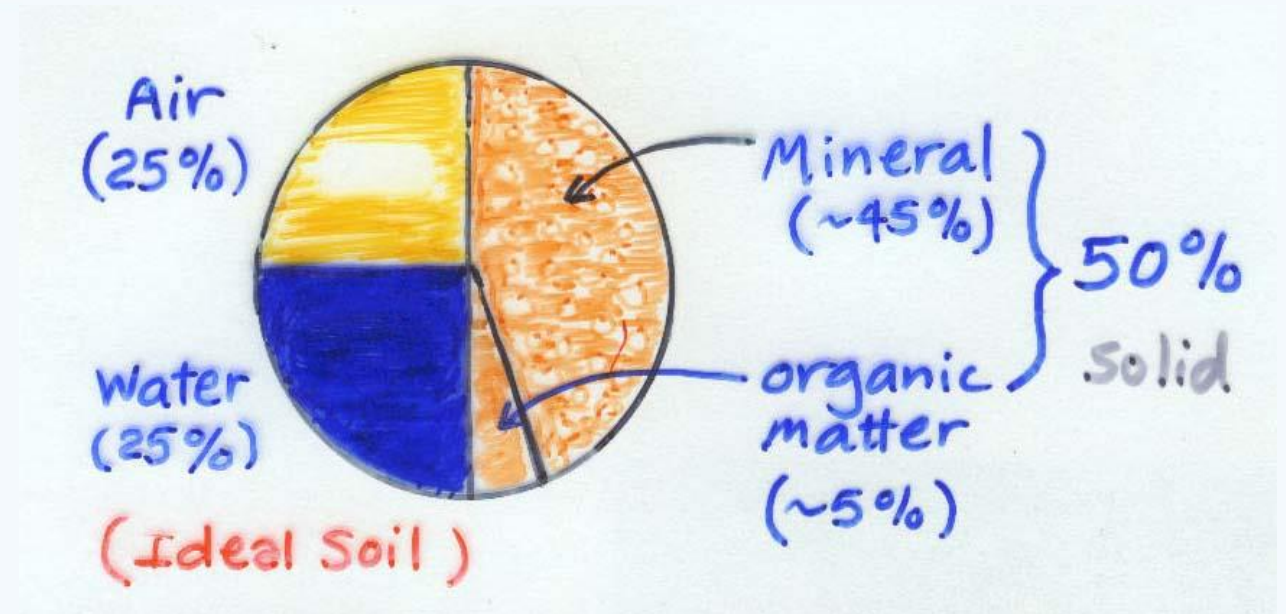
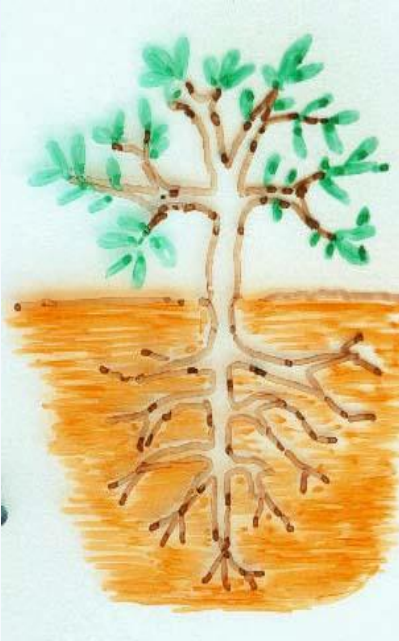


the spruce

Source & map images: USDA, <https://planthardiness.com>



Potting Soil



Soil Function

- Plant anchorage
- Provides water to plants
- Supplies plant nutrients

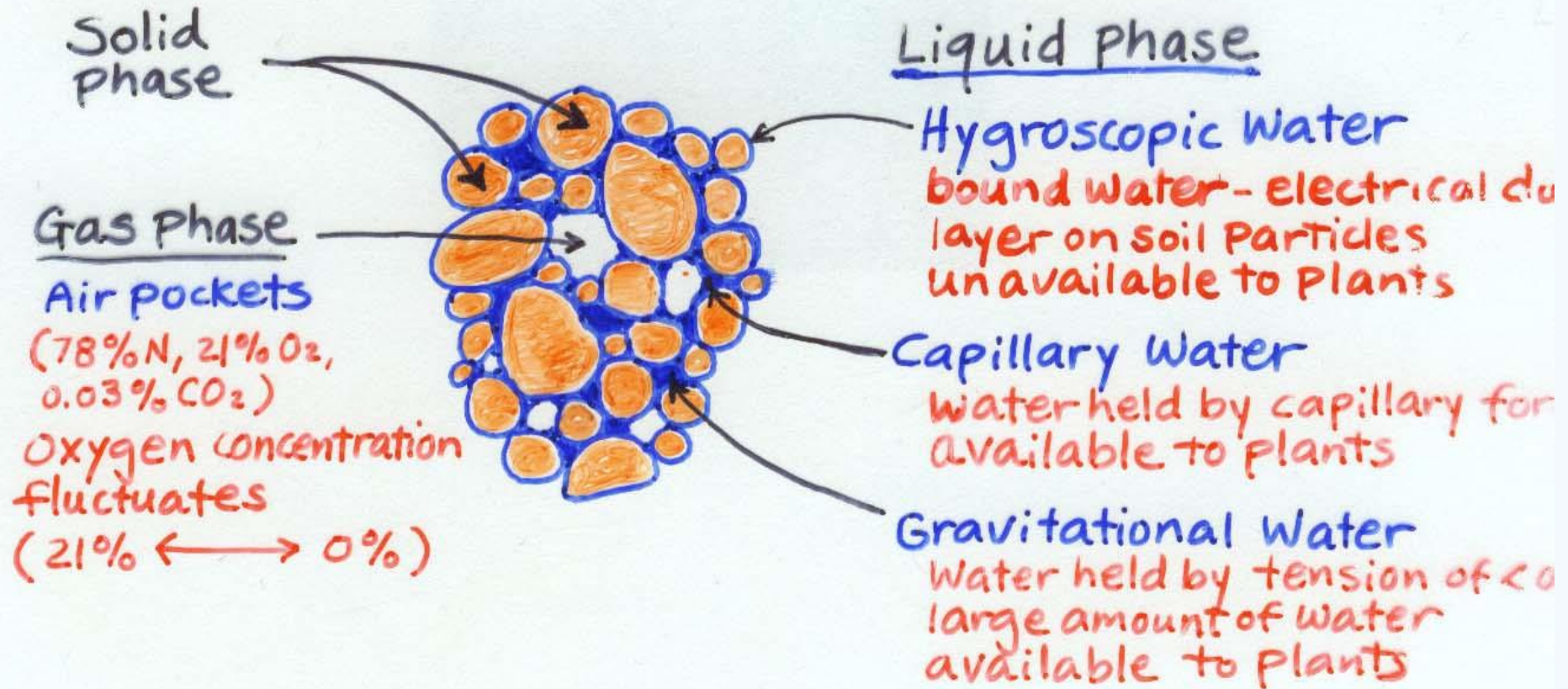
Soil Components

- Air
- Water
- Misc Matter/Minerals

Potting Soil

Functional Phases of Soil

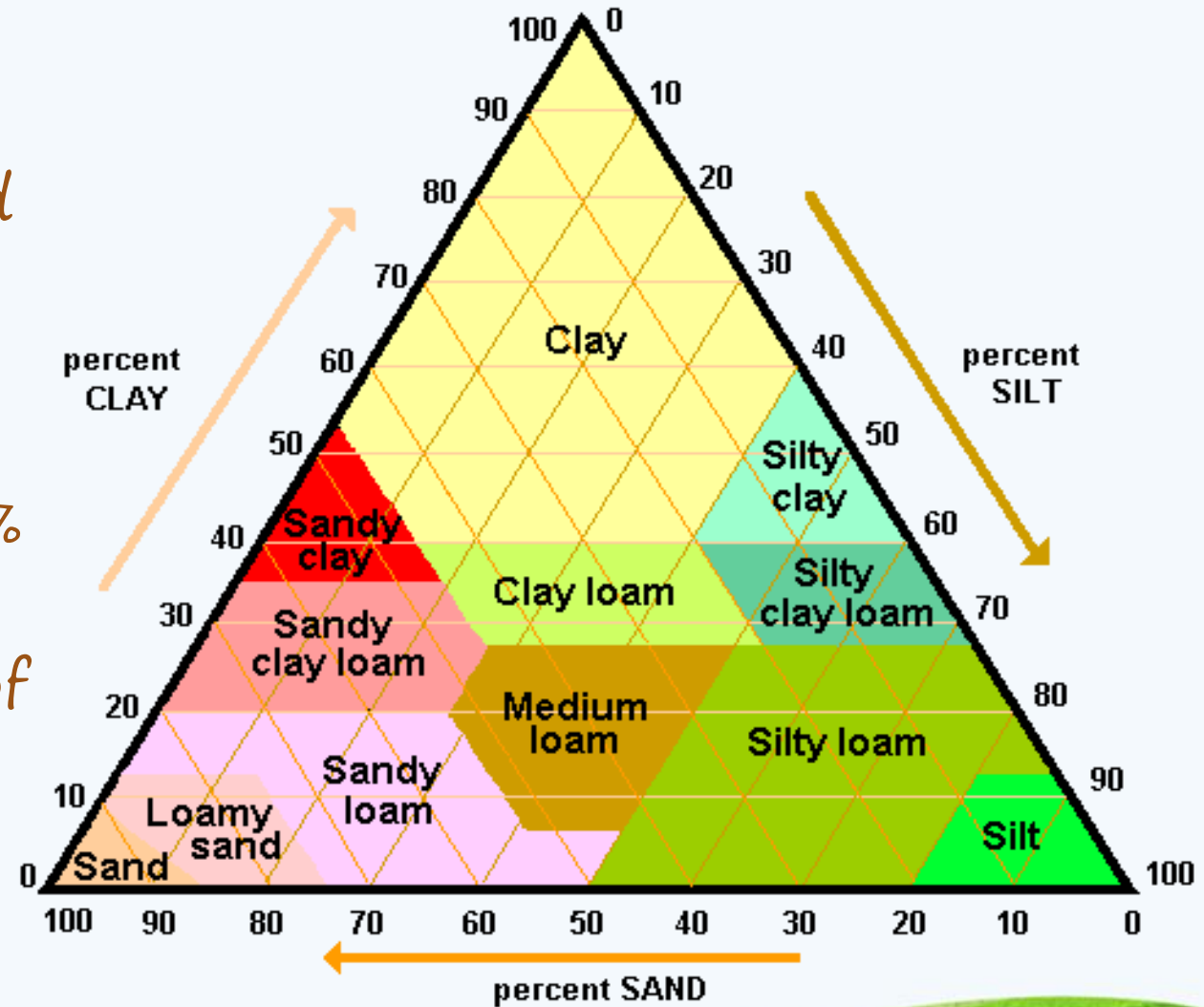
- Solid phase
- Liquid phase
- Gas phase



Potting Soil

Soil Texture Triangle

- Size of individual mineral particles varies by presence of sand, silt and clay
- Loam is defined as the mixture of sand, silt and clay
- Good soil mixture is 20% clay, 40% silt and 40% sand
- Potting soil is generally made up of equal parts of clay, silt and sand



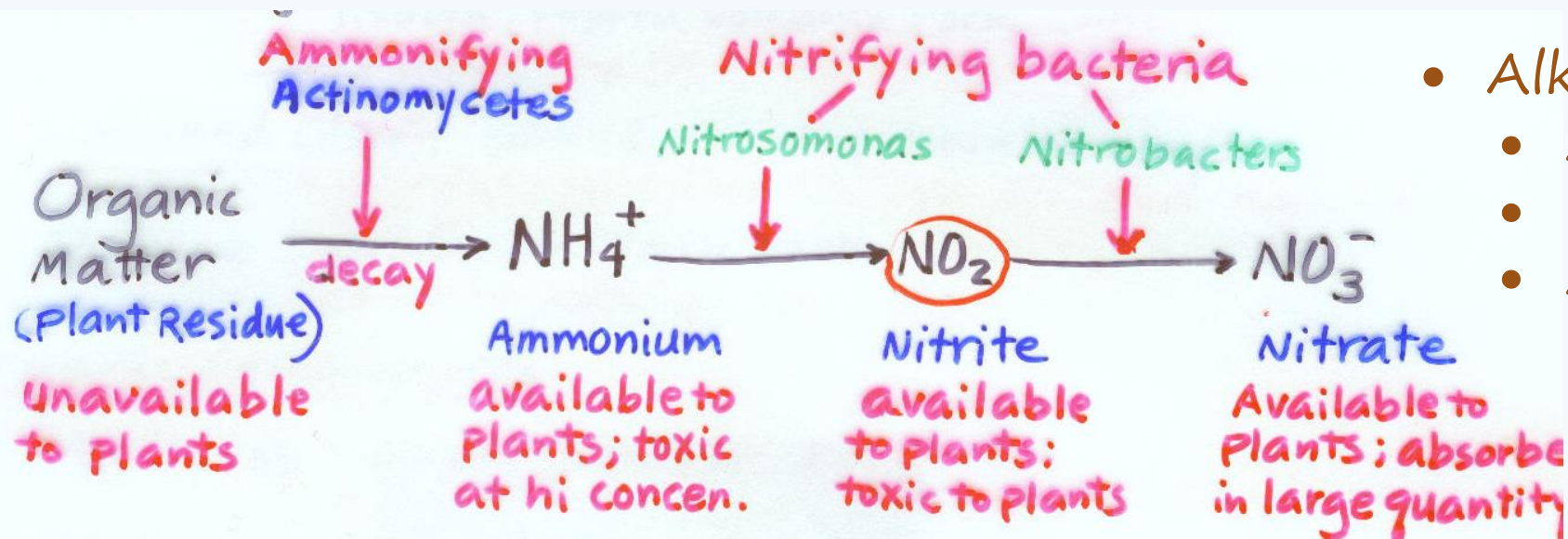
Potting Soil

- Why is PH Important
 - Nutrient availability
 - Microorganism availability
 - Nitrogen fixation and nitrification

- PH Recommendations
 - Most potting soils 5.5 - 7.0

- Acid loving plants
 - Blueberry: 4.0 - 5.5
 - Azalea: 4.5 - 5.5
 - Hydrangea: 4.0 - 5.5

- Alkalinity tolerant plants
 - Asparagus: 6.5 - 7.9
 - Sugarbeet: 6.6 - 7.7
 - Alfalfa: 6.5 - 7.7

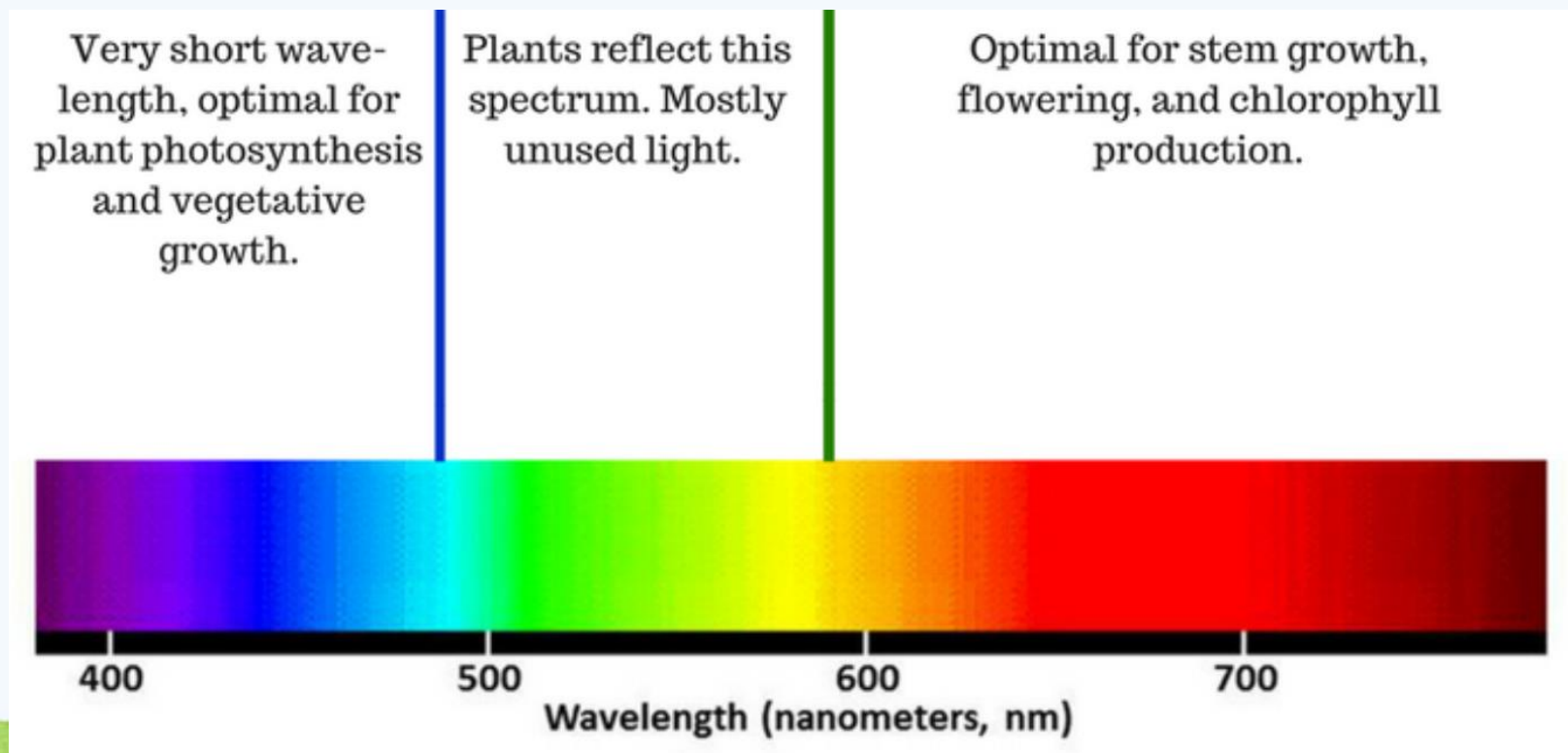
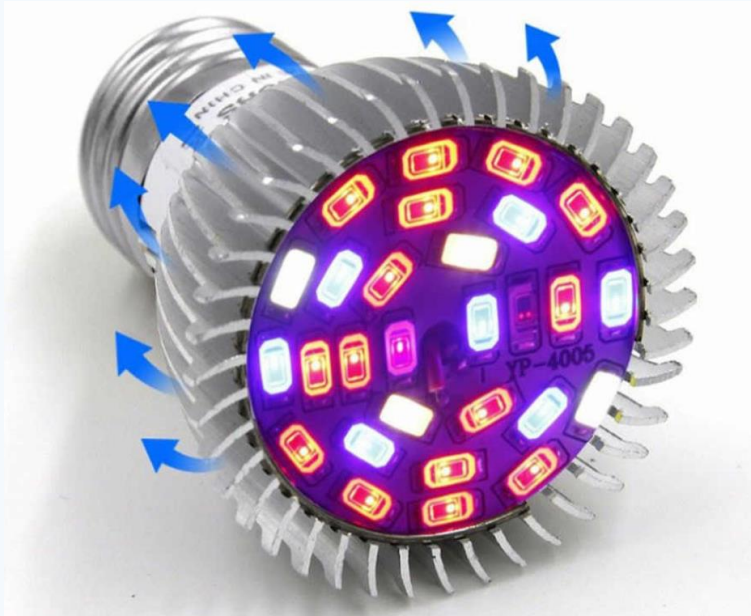


Trays and/or Pots



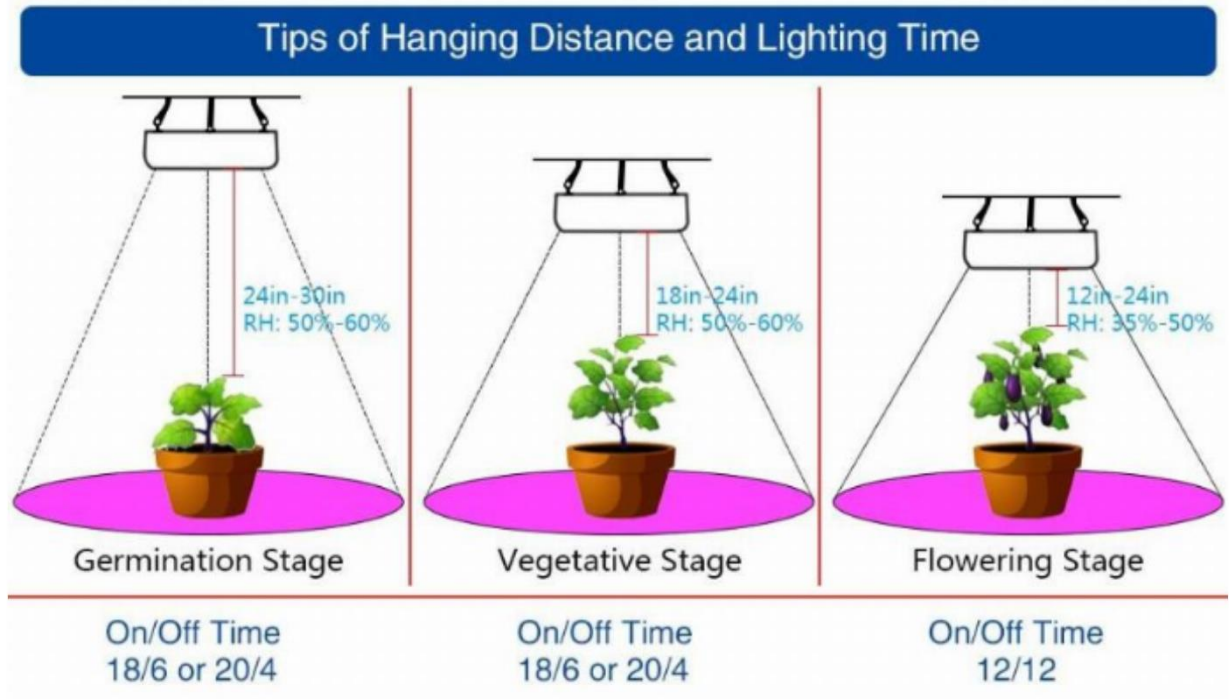
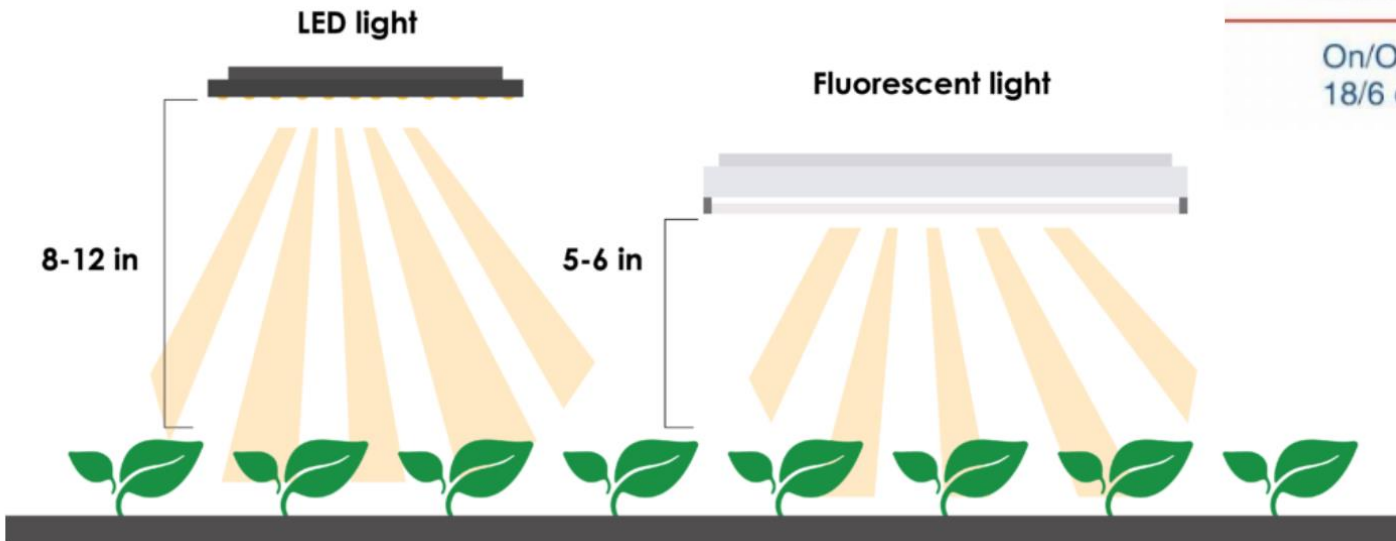
Grow Lights

- Grow lights need to generate a balanced multi spectrum light source
- LED grow lights contain various narrow spectrum LED chips
- Grow lights are generally more expensive



Grow Lights

- *Grow light placement and operation is an important consideration*
- *LED grow lights generally provide a more efficient light source than fluorescent*



Grow Lights



Heating Mats

2 Basic Heat Mats

- Constant temperature
- Adjustable temperature



- Most affordable
- Maintains seedling temperature approximately 20 F above ambient



- Temperature adjustable
- Able to optimize seedling germination temperatures

Heating Mats

- *Other Considerations When Choosing the Best Seedling Heat Mats*
 - *Type of material*
 - *Flexible plastic*
 - *Rigid PVC*
 - *Dimensions*
 - *Most common 10X20 inches*
 - *Available in 20X48 inches*
 - *Waterproof Rating*
 - *IPX4: indicates that the mat is water resistant and will withstand sprays of water, spills, and splashes without damage.*
 - *IP67: indicates that a mat is fully waterproof, and it has been tested to continue functioning even after being submerged underwater for 30 minutes.*



Tools



Tools



Damping Off

- *Start with clean pots. If reusing, wash pots and then use 1 part bleach to 9 parts water, soaking for 30 minutes.*
- *Use a sterile potting mix. If reusing, put soil in seed starting containers or other container that drains, and pour boiling water over the soil.*
- *Don't crowd the seedlings. If starting in trays, after seedlings come up, remove extras to recommended spacing.*



Damping Off



- Make sure you have good air circulation. Use a fan to help air circulation.
- Use a thin coating of sand to keep the surface of the soil dry.
- Maintain a warm environment for the seedlings, using a heating mat if necessary, to maintain 70 – 75 degrees.
- Remove any diseased seedlings or trays immediately.

Outdoor Hardening Off Set Up



Acknowledgements

- [State Maps of USDA Plant Hardiness Zones \(thespruce.com\)](https://thespruce.com)
- <https://www.ndsu.edu/pubweb/chiwonlee/plsc210/topics/chap7-soil/chap7-soil-and-growingmedia.ppt>
- [Penn State Extension | The Pennsylvania State University \(psu.edu\)](https://psu.edu)
- <https://www.urbanvine.co/blog/11-core-guidelines-urban-farmers-must-know-before-buying-grow-lights>
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- <https://www.epicgardening.com/the-best-seedling-heat-mats-and-thermostats/>
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Acknowledgements

- <https://www.google.com/search?q=examples+of+grow+lights&hl=en&source=lmms&tbm=isch&sa=X&ved=2ahUKEwi33lv8heT2AhVxHzQIHe-EDj8QAUoAXoECAEQAw&biw=1581&bih=766&dpr=2.02#imgrc=EPD4OATc5CUJMM>