



# tip sheet: **Troubleshooting Guide: Seedling Management**

## overview

A guide to maintaining healthy seedlings until transplant-ready in a classroom or basic greenhouse setting.

## objectives

### *Participants will learn:*

- to understand the basic needs of plant seedlings.

## materials

- Seedling trays
- Plant light
- Small oscillating fan
- Organic liquid fertilizer, such as kelp or fish emulsion

## resources

- Gardener's.com Recommendations for Seed-Starting and Seedling Health - <http://www.gardeners.com/How-to-Start-Seeds/5062,default,pg.html>
- About.com's Common Mistakes in Seedling Management - <http://containergardening.about.com/od/containergardening101/a/Seedmistakes.htm>

## maintaining seedling health

**1. When cotyledon (first leaves) appear**, put seed flat or container under grow lights, or in as direct sunlight as possible. The plant lights should be about an inch or two above the plants' leaves.

**2. To strengthen the leaves and insure good circulation**, set up a small oscillating fan. Keep it on low. If you do not have a fan, make a practice of gently brushing the plants with the back of your hand when you check in on them (to water, etc).

**3. Water seedlings regularly and deeply**, rather than superficially. Water based on observation, when the soil seems dry – not on a set schedule. If the soil has dried out entirely, set the plant flat in standing water until the soil is once again moist. Remove from water before the plant roots suffocate, and resume your watering schedule.

**4. Thin seedlings if necessary.** If you planted multiple seeds per cell or pot, use scissors to trim away extra seedlings, or delicately pull them without disturbing the other plants.

**5. After first true leaves appear, begin a mild and highly diluted liquid fertilizing regime** as directed by product package instructions. Kelp and/or fish emulsion work well. Be aware of signs of fertilizer burn. If this occurs, simply cut back on fertilizing and wait for new unaffected growth to appear.

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## **maintaining seedling health (con't)**

**6. Before transplanting outside, harden off** your seedlings. Gardeners use a few tools to enable a smooth transition: moving plants outside, but keeping them under a blanket-like material called row cover, or Remya (a product name) to gently filter light and hold warm air; transitioning plants from the nursery to cold frames, all the while maintaining a schedule of hardening-off. This regime might include brushing the baby plants with the back of your hand for a few minutes a day (or using a gentle fan) to get them used to the wind, or moving plant flats in and out for short periods of time to get them used to sunlight.

**7. Once seedlings have reached a safe transplant size** (3" or so in height), step up your seedlings to a larger pot or outdoors.

## **causes of spindly seedlings**

- **Not enough light.** Seedlings need 12-16 hours of light a day, and that needs to come as directly as possible. Diffuse light through a window doesn't count. Plant lights work best, and are most effective 1-2" above the seedlings. Once plants attenuate, or stretch, towards light, it is difficult to recover normal growth — and it can happen in a matter of days!
- **Temperature too high.** With a few exceptions, most vegetables are happy in greenhouse temperatures of high 70° F during the day and down to 50° F at night. If you have your seed trays on propagating mats, be aware that the soil temperature might be too high for the roots of your growing seedling.

- **Not enough air movement.** Plants are acclimated to outdoor growing, and in a classroom or greenhouse, it is best to approximate what windy conditions will feel like. It keeps the plants stocky and prevents damping off fungus.
- **Seeds planted poorly.** If the soil was dry for too long, seed may not sprout. If the seeds were planted too deep, they may have sprouted, but not pushed to the surface of the soil. Plant seeds approximately twice as deep as their size, or as directed on your seed packet.
- **Fertilizer mismanagement.** Because you are raising them in a sterile growing mix with no added nutrients, seedlings benefit from a heavily diluted fertilizer such as liquid kelp or fish emulsion. Read packaging instructions carefully. Misapplication can cause fertilizer burn.

## **vocabulary**

- **Flat/seed-starting tray/cell pack:** Designed for seed-starting, plant flats are also called seed-starting trays or cell packs. Each refers to a different type or size of the same concept: a well-drained, small-volume grid ideal for seed-starting.
- **Cell:** The individual sections of a plant flat or seed-starting tray, each designed at a size ideal for various plants and stages of plant growth.
- **Propagating mat:** A specialized heat mat for plants designed to control the soil temperature for successful germination.
- **Attenuation:** The process of the lengthening of plant stems when reaching for a viable light source.
- **Leaf discoloration, seedlings:** For a variety of reasons, when the young leaves of a plant develop spots, bruises, bleach marks, etc.