

Direct seeding schedule and soil temperatures

Plant before frost-free date and when soil temp is at least 45F/7C:

Beets, broccoli raab, broccoli, carrots, chicory, kale, lettuce, onions, parsnips, peas, spinach, and turnips

Plant before frost-free date and when soil temp is at least 50F/10C:

Cabbage, cauliflower, radish, Swiss chard

Plant after danger of frost and when soil temp is at least 60F/16C:

Beans and corn (treated corn seed only; for untreated seed, wait for 65F/18C)

Plant after danger of frost and when soil temp is at least 70F/21C:

Cucumbers, gourds, melons, okra, pumpkins, squash, watermelons

Tracking soil temperature

Because temperature is so important to seed germination, it pays to keep track of soil temperatures in early spring. Buy a soil thermometer with a pocket clip and carry it with you to get in the habit of monitoring temperatures. Here are some guidelines for using a soil thermometer:

Measure where you are going to plant because temperatures can vary across a field. Soil temperature can be affected by a number of factors including mulch or crop debris on the soil surface; orientation of the field, with south-facing fields warming fastest; and soil moisture, with dry soils warming quicker than wet soils.

- Insert the bulb only as deep as the seeding depth, usually no more than 2".
- Wait two or three minutes before removing the thermometer.
- Take a reading in the morning, when soil is coldest, and another in late afternoon, when it's warmest. Average the two to get the average daily temperature.
- When your target temperature has been achieved for three days in a row, you're good to go!
- If soil remains too cool beyond your normal planting date, try placing row cover on hoops above the bed. It will warm the soil within a few days and the row cover will provide a beneficial environment for early growth. For extra warming, lay IRT mulch film or black biodegradable mulch film on the bed. Get the mulch taut and in contact with the soil for maximum benefit.

Hardening off

The seedlings that you have tended so carefully in the warm, humid greenhouse will soon be planted outside, where they will be exposed to wild temperature swings, wind, rain, and brilliant sunshine. It's a tough transition for plants, one that can set them back severely unless you take the time to harden them off.

Hardening off means introducing young plants gradually to the world outside. This process is easy when you have a few flats of plants; you can put them outside for a few

hours and gradually increase the amount of time each day for a week or so. But when you're a commercial grower, with dozens or hundreds of flats, you don't have time to move plants in and out of the greenhouse twice a day. Here are some suggestions for hardening off plants on a market farm.

Most growers create a separate hardening off area apart from the greenhouse, where plants can be moved for a week before being planted outside. Ideally, the hardening off area will be cool, bright, and with some wind exposure yet also have emergency heating in case the temperature takes a dive.

An unheated hoophouse makes a good hardening off area for transplants. If the doors and sides are open during the day, the plants get acclimated to outside conditions. Closing the hoophouse at night protects them from low temperatures and deer.

A second option is a low tunnel made of hoops and row cover. It can be a temporary structure, right outside the greenhouse, with pallets for a floor to hold seedling flats. If the greenhouse has roll-up sides, the hardening off area can be built along the sidewall so that it can get heat from the greenhouse if necessary.

Some growers use their farmers market canopies to provide shelter for transplants if frost is not expected. Others have tables set up under trees or near buildings that cast some shade during the day. In both cases, it's important to have hoops or posts on which to hang row cover or poly at night for additional cold protection.

Hardening off involves more than acclimating plants to weather. The process should also help plants adjust to lower levels of fertilizer and water than they received in the greenhouse. Fertilizing can be stopped and watering reduced in the week before moving the plants outdoors to harden off. A light foliar feeding of kelp just before moving them out will help the plants deal with cold stress. Then, two or three days before planting in the field, the transplants should be fertilized with fish emulsion or other liquid nitrogen fertilizer to help them resume growth.

Spring cover crops

While your thoughts at this time of year may be focused primarily on the delicious vegetables you're growing for market and your own table, don't forget about cover crops. Early spring is the best time to plant many crops that will benefit you in the months and years ahead. Here are some examples of ways to use cover crops.

- Plant nitrogen-fixing legumes to increase soil fertility for a subsequent crop.
- Plant buckwheat in an area reserved for summer vegetables or flowers to prevent weeds in the meantime.
- Plant a green manure mix now then plow it in later in the season to increase organic matter and nitrogen.
- Grow a living mulch by underseeding brassicas with New Zealand white clover.