

Building Healthy Soils in Vegetable Gardens: Cover Crops Have Got It Covered

Part IV: Planting and Managing Cover Crops in Vegetable Gardens

Megan M. Gregory

Email: meganmgregory1@gmail.com; Website: <http://blogs.cornell.edu/gep/>

This article is part of a four-part series about cover cropping in vegetable gardens. To learn more, see:

- *Part I: Introduction to Cover Cropping*
- *Part II: Types of Cover Crops -- Non-Legumes, Legumes, and Mixtures*
- *Part III: Selecting Cover Crops for Vegetable Gardens*

Once you've chosen cover crops that fit your vegetable rotation, management goals, and garden site (See Part III: Selecting Cover Crops for Vegetable Gardens), it's time to plant! This article contains tips on sourcing seed, and planting and managing cover crops using hand tools.

Sourcing Cover Crop Seed

- **Plan ahead!** Order your seed and [legume inoculant](#) (or confirm that local sources will stock what you need) in early spring, even for late summer or fall plantings. This will ensure that you find the varieties you want, and that you have the seed when it's time to plant. You can find a [list of cover crop seed suppliers](#) in the book [Managing Cover Crops Profitably](#).
- **Try to source disease-resistant varieties** (e.g., Esker or Kame oats, Aroostock winter rye, etc.). Your local Cooperative Extension office can provide guidance on recommended varieties for your area.
- **Coordinate with other gardeners.** Cover crop seed may be less expensive (on a per-pound basis) when purchased in larger quantities. By purchasing larger bags of seed with a group of gardeners and distributing the seed, you may be able to save money.

Planting

Plant your cover crops on time (Table 1). Cover crops provide the most benefits when planted with ample time to grow during favorable weather. Delaying planting just two weeks past ideal dates can greatly reduce cover crop growth and weed suppression.^{1, 2} Your local Cooperative Extension and the book [Managing Cover Crops Profitably](#) can provide guidance on ideal planting dates for different cover crops in your area.

When planting legumes, use a [legume inoculant](#). In order to fix nitrogen, each legume species requires that a particular type of *Rhizobia* bacteria be present in the soil to form nodules³ (See Part II: Types of Cover Crops). Inoculation involves mixing a small amount of powder, containing appropriate *Rhizobia* bacteria, with legume seed at planting. To learn more about selecting the right inoculant and treating your legume seed with it, refer to the eOrganic publication [Legume Inoculation for Organic Farming Systems](#).

Table 1. Planting dates for winter-kill and over-wintering cover crops, USDA Zone 7. Planting dates should be earlier in cooler zones (6 and below), and may be pushed later in warmer zones (8 and up).

Cover Crop	Planting dates
Winter-kill cover crops	
Oats, Field peas, Brassicas	Late Aug – early Sept
Over-wintering cover crops	
Crimson clover	Early - mid-Sept
Hairy vetch or Rye/ vetch	Mid-Sept - early Oct
Rye	Mid-Sept - late Oct

- **To plant your cover crops:**

- **Prepare your plot.** Remove weeds and crop residues, and -- if you are under-seeding cover crops to standing food crops -- stake and prune crops that are still producing. This creates space and light for your cover crops to grow.
- **Rake the soil** to create a fine seedbed.
- **Broadcast the seed evenly.** In garden settings, high seeding rates are recommended to achieve weed suppression.⁴ In our work with gardeners in Brooklyn, we used ½ cup of seed for each 20 ft² area.⁵ You can experiment to find a seeding density that provides good soil cover and healthy plant growth.
- **Gently rake in the seed**, with small back-and-forth motions to bury the seed (Fig. 1).
- In urban areas, it may be necessary to **protect newly planted seeds with row cover**, to prevent birds from eating the seed (Fig. 2).⁵ The row cover can be removed once plants are established.



Figure 1. Raking in cover crop seed in a community garden.



a



b

Figure 2. a) Row cover over newly planted cover crop seed. b) Cover crops germinating under row cover. (Photo credits: M. Gregory)

Once planted, cover crops don't usually require much maintenance. If conditions are very dry, it may be beneficial to water the cover crop until it is well-established. This can be done with a sprinkler, or – in small areas – with a watering can.

Managing Cover Crops in Spring

Winter-kill cover crops are easy to manage, because they are killed by frost and usually don't leave a lot of residue by Spring. Vegetable crops can be transplanted through the mulch, or a shallow cultivation will prepare a fine seedbed for crops grown from seed.

Over-wintering cover crops require more work but are well worth the effort, as they provide much more organic matter, fixed N, and weed suppression than winter-kill cover crops.⁵ Here's how to manage stands of crimson clover, hairy vetch, rye, or perhaps a mixture:

- **Wait for the cover crops to flower (Fig. 3) before terminating the stand.** Cover crops should be killed while in full bloom, but before they set seed. Here's why:

- First, when cover crops flower, they are at their maximum biomass and (for legumes) nitrogen fixation. Just a couple weeks' growth in the spring can make a big difference for organic matter and nitrogen contributions to the soil.⁶
- Second, cover crops are easier to kill at flowering – cutting the stems at ground level is enough to kill them. If you try to cut down the cover crops before flowering, they may re-sprout.

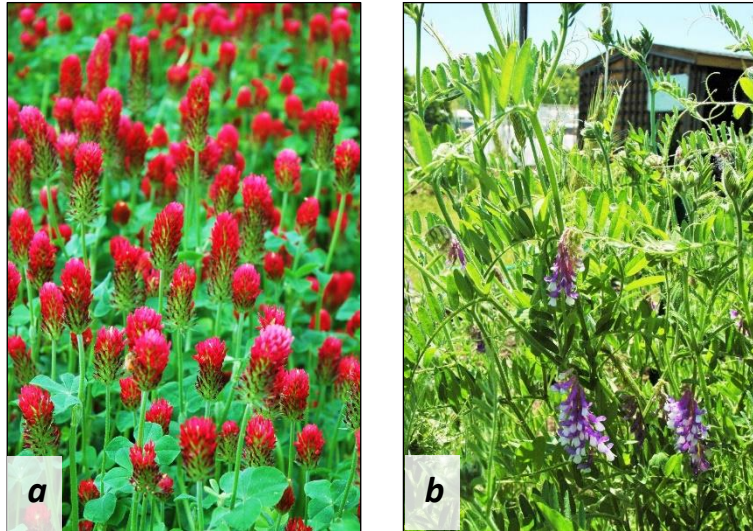


Figure 3. Flowers of over-wintering legume cover crops: a) crimson clover, and b) hairy vetch.

To maximize cover crop contributions to soil organic matter and N fertility (and to prevent re-sprouting), gardeners should wait until the legumes are in full bloom before terminating the cover crop. Photo credits: M. Gregory.

- **Decide whether you will “cut-and-mulch” or incorporate your cover crop.**

- **The “cut-and-mulch” technique** involves chopping the cover crop shoots and leaving them on the soil surface as a mulch, without burying the residues. This technique reduces soil disturbance and conserves more organic matter, leaves mulch for moisture conservation and weed suppression, and is less work. However, the cover crops *must* be in full flower, or they may re-sprout.
- **Incorporating the cover crop** involves working the chopped cover crop shoots into the soil with a shovel. This will create a finer seedbed and promote more rapid release of N from legume residues. However, less organic matter will be conserved in the soil (since soil organisms will break it down more quickly), and you must wait at least a few weeks to plant vegetable crops until the clumps of plant material decompose.

- **If you cut-and-mulch your cover crop:**

- Cut down the cover crop using a sharp pair of hedge shears or small sickle (Fig. 4). Begin at the top and work your way down to ground level, chopping the shoots into smaller pieces. Then, leave the chopped shoots as mulch on the soil surface. **DO NOT pull up the plants** – letting the roots decompose in place aerates the soil and preserves organic matter.
- If you are transplanting vegetables (for example, tomatoes, peppers, or zucchini) you don't need to wait after mulching the cover crop. Simply push apart the mulch and dig holes to set your transplants.



Figure 4. Cutting down a crimson clover cover crop with hedge shears (left), leaving a thick mulch of chopped shoots to conserve soil moisture and suppress weeds (right). Photo credits M. Gregory.

- **If you incorporate your cover crop:**

- Cut down the cover crop with hedge shears, as outlined above. Then, use a sharp shovel to further chop the shoots and work them into the top 3-5 inches of the soil.
- Before planting seeds or setting transplants, wait at least 10 days, then check the seedbed. If there are clumps of plant material, wait a little longer. Grasses (e.g., wheat, rye) may take longer than legumes (e.g., clover, vetch) to break down.

References

(1) Stivers-Young, L. 1998. Growth, nitrogen accumulation, and weed suppression by fall cover crops following early harvest of vegetables. *HortScience* 33(1):60-63.

(2) Teasdale, J. R., T. E. Devine, J. A. Mosjidis, R. R. Bellinder, and C. E. Beste. 2004. Growth and development of hairy vetch cultivars in the northeastern United States as influenced by planting and harvesting date. *Agronomy Journal* 96(5):1266-1271.

(3) Grossman, J. 2012. Legume inoculation for organic farming systems. Accessed online at: <https://www.extension.org/pages/64401/legume-inoculation-for-organic-farming-systems>, 16 December 2014.

(4) Drinkwater, L. E. 2010. Clover-grass combinations for cover cropping. *New York Organic News*:12-13.

(5) Gregory, M. M., L. E. Drinkwater. In preparation. Developing cover cropping practices to improve soil quality, nutrient cycling, and weed suppression in urban community gardens.

(6) Clark, A. 2007. *Managing cover crops profitably*, 3rd ed. Sustainable Agriculture Network, Beltsville, MD. Accessed online at: <http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>, 7 December 2014.