

6 plant cover crops



Protect the Chesapeake Bay

Like farmers, homeowners play an important role in protecting our soil and water resources, especially the Chesapeake Bay. This series of fact sheets highlights various conservation measures—best management practices—that farmers use to produce healthy crops and protect water quality in the Chesapeake Bay and its tributaries. Homeowners can apply these same conservation measures to home, lawn, garden, and landscape projects. Working together, we can make a difference for the Bay. For more information on ways to improve your lawn or garden and protect the Bay, contact the organizations listed on the back panel.



Cover Crops Protecting the Bay

Maryland farmers understand the benefits of planting cover crops. Each fall they plant thousands of acres of cereal grains, legumes, and other types of cover crops on their fields to provide a “living protective cover” against erosion and nutrient runoff. They know that soil left uncovered over the winter easily erodes into nearby waterways and ultimately the Chesapeake Bay, carrying with it nutrients and other contaminants. Planting cover crops in the fall is one of the most cost-effective and environmentally beneficial ways to control soil erosion, recycle unused plant nutrients, and protect water quality in the Bay and its tributaries.

Because of their environmental benefits, cover crops are a key feature in Maryland’s plan to protect and restore the health of the Chesapeake Bay. But that’s not the only reason why farmers plant cover crops. Cover crops help improve soil health. As they grow, cover crops form a dense mat that reduces weeds, provides habitat for beneficial insects, and conserves soil moisture. After cover crops are tilled under in the spring, both roots and top growth add organic matter and nutrients to the soil.

Improve Your Soil—Protect the Bay

Don’t let your garden sit idle this winter. Follow the lead of Maryland farmers and plant hardworking cover crops in your garden this fall to control erosion, reduce nutrient runoff, and bolster your garden’s productivity. Cover crops are typically planted as seeds (not transplants) in early autumn after the last summer vegetables have been harvested and before the cold weather sets in. In the spring, it is important to provide ample time for killing the cover crop and allowing it to decompose. This process, if not timed properly, can impact fertility management for spring crops. Please see sections on *Managing the Cover Crop in Spring and Additional Tips*.

Types of Cover Crops for Vegetable Gardens

Instead of being harvested, cover crops are tilled back into the soil, or left in place to decompose after they are killed. As they decompose, cover crops return valuable nutrients to the soil as a “green manure.” There are many types of crops that can perform this task in your garden.

Cereal grains such as wheat, barley, cereal rye, and spring oats, are cold tolerant and work well when planted in the fall. They grow until a deep freeze sets in, go dormant, and then resume growing in spring. Their roots help break up compacted clay soils and they are excellent at recycling nitrogen left over from summer crops.

Annual ryegrass is a grass that is easy to establish. It is good at controlling soil erosion and reducing soil compaction, but left unmanaged, can become a weed.

Buckwheat is a broadleaf plant that serves as an excellent “smother crop” to control weeds and conserve soil moisture. It is fast growing—maturing in 6-8 weeks—and a good choice for areas that might be left bare over the summer. Its white flowers attract pollinators and other beneficial insects and can be used in flower arrangements. It will re-seed if mature seeds fall to the soil. Plant buckwheat in spring or early summer.

Forage radish has a very large taproot that can extend more than three feet into the ground to help penetrate compacted soils. In most years it will winter kill, leaving a mat of dead vegetation that can be planted through in spring or turned under.

Crimson clover, alfalfa, hairy vetch, and Austrian winter peas are legumes that take nitrogen from the air and convert it into a form used by plants. Gardeners can enhance this natural process by purchasing seed that has been pre-inoculated with Rhizobium bacteria—microbes that fix nitrogen inside the root nodules of legumes. Rhizobium bacteria may also be purchased separately and dusted onto legume seeds by shaking them together in a paper bag.

Additional Tips

- To sow a fall cover crop while summer vegetables are still producing, remove mulch from around plants and rake the area smooth. Sow the seeds. The cover crop will get a good start but will not interfere with the vegetable harvest.
- Give fall cover crops plenty of time to become well established—plant at least four weeks before the first killing frost. The one exception is cereal rye, which can be planted right up to a frost.
- Winter wheat and winter rye will produce massive root systems—great for breaking up tight, clay soil. They can be difficult to turn under in the spring without the aid of a tiller.
- Remember that spring planting may be delayed by two to three weeks by a cover crop.
- You can mow crimson clover close to the ground and plant vegetables directly into the residue.
- Don’t till wet soil. Field test to determine if soil is OK to till or spade—pick up and squeeze a handful of soil. Bounce it up and down in your hand. If it falls apart easily, it’s OK to work your soil.

Sources: Information adapted in part from the publication, **Protect and Improve Your Soil with Cover Crops** (GE 006, UME, 2009). Additional input provided by the Maryland Department of Agriculture’s Cover Crop Program.





COVER CROPS FOR VEGETABLE GARDENS

Type of Cover Crop	Seeding Rate per 100 Sq. Feet	Planting Dates*	When to Turn Under	Notes
Alfalfa (<i>Legume</i>)	½ ounce	Spring or late summer	Fall Spring	Needs warm temperatures for germination. Hardy and drought tolerant.
Austrian Winter Peas (<i>Legume</i>)	3 ounces	September 1 to October 1	Spring	May need to mow before turning under.
Barley (<i>Cereal Grain</i>)	4 ounces	August 15 to October 1	Spring	Not as hardy as rye. Tolerates drought.
Mustard, Kale, Rapeseed	1 ounce	September 1 to October 1	Spring	Quick germination and growth.
Buckwheat	2 ½ ounces	Spring or summer	Anytime	Grows quickly. Will re-seed itself. Not cold hardy.
Crimson Clover (<i>Legume</i>)	3 ounces	September 1 to October 1	Fall Spring	Beautiful spring blooms attract beneficial insects.
Forage Radish	4 ounces	August 15 to October 1	Spring	Large white roots break up clay soil. All parts are edible. Monitor for harlequin bugs. Does not tolerate very wet soils.
Hairy Vetch (<i>Legume</i>)	3 ounces	August 15 to October 1	Spring	Slow to establish. Fairly hardy. Till under at bloom; can become a weed.
Rye (<i>Annual Ryegrass</i>)	3 ½ ounces	August 15 to October 1	Spring	Rapid, dense growth.
Spring Oats (<i>Cereal Grain</i>)	4 ounces	Spring August 15 to October 1	Summer Spring	Not cold hardy; tolerates low pH.
Winter Rye (<i>Cereal Grain</i>)	4 ounces	August 15 to October 1	Spring	Can be planted later than other cover crops.
Winter Wheat (<i>Cereal Grain</i>)	4 ounces	August 15 to October 1	Spring	Easier to kill and manage than rye.

*Actual planting date will depend on the location, species and weather forecast.

COVER CROPS IN ACTION (PHOTO GALLERY)

CRIMSON CLOVER



BARLEY



FORAGE RADISH



BUCKWHEAT



RAPSEED



CEREAL RYE



Mustards, kales, rapeseed (plants in the cabbage family) have long taproots that penetrate subsoil and improve drainage. These plants are fast growing and produce a beautiful canopy of golden flowers when mature. In addition, they produce chemicals that act as a bio-fumigant in the soil, helping to control certain pests.

Cover crop blends combine the best features of different types of plants into a single planting. Many seed companies offer these specialized blends so that gardeners don't have to guess how much of each variety to use.

Where to Buy Seed

Purchase seed locally, if possible, from a garden center or farm supply store. You can also order cover crop seed from retail seed companies. Store unused seeds in a sealed container in a cool, dry location.

When to Plant

Plant cover crops one month before the average date of the first hard freeze in your area. Some cover crops need warmer weather to germinate, so check the seed package for instructions. Cold-hardy cover crops, including cereal rye and legumes, may be planted up until the first frost, especially if mild temperatures are in the extended forecast.

Care

Cover crops require very little care. Irrigation may be necessary to get seedlings established if the weather is warm and dry. Many cover crops will grow until temperatures are consistently below freezing and then become dormant in the winter. Growth will resume in early spring.

How to Prepare the Seed Bed

- Prepare the soil by tilling under or removing plant debris and mulch from summer crops.
- Rake the area smooth. Next, broadcast the seed by hand or with a hand held broadcast seeder, ideally before it rains.
- Use the amount of seed shown in the accompanying chart.
- Mixing very small seeds with soil or compost may make them easier to distribute by hand.



- Gently rake seeds evenly into the soil to establish good soil to seed contact and protect seeds from birds.
- The seed must be in direct contact with the soil to germinate; walk on the seeds to press them into the soil.

Managing the Cover Crop in Spring

Most fall-planted cover crops will begin growing vigorously in February or March depending on weather conditions. Several weeks before you are ready to plant your spring vegetable crops, you will need to suppress growth and kill your cover crop. Your soil and vegetable crops will benefit most if this is done right before or during the flowering stage, but it's fine to start the process earlier to fit your garden plan. Do not allow cover crops to go to seed.

Follow these guidelines:

Option 1:

- Cut the cover crop to the ground using a mower or weed trimmer.
- If you have a tiller, incorporate the residues into the soil. (If your tiller is powerful, you may be able to skip the first step.)

Option 2:

- Cut the cover crop to the ground using a mower or weed trimmer.
- Cover the area with a black tarp or heavy duty weed barrier. Pin the material to the ground. Remove the tarp in two weeks.
- Incorporate the residues into the soil with a garden fork or spade and smooth the area with a metal rake, OR plant directly into the plant residues.
- Soil microorganisms will use available nitrogen in the soil to decompose the dead cover crop. This could lead to a shortage of nitrogen for crops planted too soon after the cover crop is killed. Lightly fertilizing seedlings and transplants can solve the problem. In addition, some cover crops such as cereal rye inhibit seed germination, so patience is a virtue when it comes to your cover crop.

