

Cover Cropping

TO IMPROVE CLIMATE RESILIENCE

Managing a continuous cover of plants to help improve soil health and prevent erosion

Is your field covered from climate impacts?

More extreme and frequent precipitation events are increasing soil erosion and nutrient runoff problems across the Northeast. Wetter spring and falls are reducing the number of days that fields can be worked. Consider adapting to these trends with cover crops.

Compared to leaving soil bare between cash cropping periods, continuously growing plants in a field provides a variety of benefits that can bring greater economic and crop production stability to a farm.

Cover crops increase soil organic matter, retain nutrients scavenged after crop harvests, improve soil moisture holding capacity, prevent soil erosion, deter nutrient runoff, alleviate soil compaction, and can even help to suppress some pests.



Uncover the Benefits

- 1** When cover crops decompose, they help feed soil life and contribute to stable soil organic matter, which improves nutrient cycling and soil structure.
- 2** Cover crop soil organic matter can help join soil particles into stable aggregates, which together with root channels help soils better absorb intense rain, resist erosion, and improve water holding capacity in drier times.
- 3** Cover crops intercept and lessen the force of raindrops, reducing adverse impacts (soil erosion, compaction, nutrient runoff) from intense rainstorms.
- 4** Cover crops can help dry out fields that are too wet before planting.
- 5** Cover crops help mitigate environmental impacts of agriculture by reducing water pollution risks and removing CO₂ from the atmosphere, reducing a farm's carbon footprint.

- 6** Cover crops promote economic benefits by increasing crop yields, reducing machinery costs, out-competing weeds, breaking disease and insect cycles, hosting beneficial organisms, attracting pollinators, scavenging nutrients, and supplying forage.

Careful Considerations

- 1** Seed, fuel, and planting costs may not offset the benefits of cover crops in the short-term; benefits are often experienced in the long-term.
- 2** Some cover crops may go to seed and become a weed if not properly managed.
- 3** Cover crops may immobilize nitrogen or deplete soil moisture, causing yield loss in the subsequent crop.
- 4** The degree and duration of benefits from cover crops are affected by climate, management, and genetics.
- 5** Desired cover crop varieties may be in short supply.





This factsheet was developed through collaborative, crowdsourced efforts by Northeast cover crop experts: **Thomas Bjorkman**, Department of Horticulture, Cornell University; **Michel Cavigelli**, Research Soil Scientist, USDA-ARS Sustainable Agricultural Systems Laboratory; **Dan Dostie**, State Resource Conservationist for Pennsylvania, USDA-NRCS; **Joshua Faulkner**, Farming and Climate Change Program Coordinator, Center for Sustainable Agriculture, University of Vermont; **Lynn G. Knight**, Agricultural Economist, USDA-NRCS; **Steven Mirsky**, Research Ecologist, USDA-ARS Sustainable Agricultural Systems Laboratory, and **Brandon Smith**, Northeast Region Team Leader, USDA-NRCS Soil Health Division.

Image descriptions and credits: **[front, top]** Rolled winter cereal cover crops provide weed suppression for organic no-till production systems, Jeff Liebert; **[front, bottom]** On farm participatory cover crop trials with daikon radish, Mary Ellen Canon; **[back, top]** A rolled cereal rye cover crop suppresses weeds in organic no-till planted soybean production, Jeff Liebert; **[back, middle]** Pumpkins strip tilled into cover crop residue, Chad Cochrane; and **[back, bottom]** Triticale, winter rapeseed and winter pea, interseeded into corn silage, Kirsten Workman.

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Northeast Climate Hub
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about their soil**

Application Methods & Tips

The first step is to decide what you want to address with cover crops, and then select covers that meet those needs. For example, a grass or brassica cover crop may provide excellent nutrient scavenging, but only a legume will be able to provide new nitrogen. Yet, both can help protect soil against erosion. The timing of cover crop establishment can also greatly influence its tolerance to the cold wet conditions in the fall, and earlier establishment can help covers overwinter better.

Nonetheless, if you are just starting out with this practice, the best approach is always to start small. Plant some test strips, or use small fields, and see how it works out. From here, you can start to adjust the timing, species, and planting method until you find a combination that works for you, on your soils, with your management style, and with your rotation selections. Information is available from University Extension, USDA Service Centers, Conservation Districts, and crop consultants.

Schedule a time to host a knowledgeable advisor to visit your farm. They will be able to help you refine your current and future plans to develop climate adaptive cropping systems. Finally, it is useful to attend regionally specific workshops and meetings to network with farmers and agricultural professionals, and to gain technical information on the latest cover crop research. You may also want to speak with your Conservation District or Extension personnel to see if there are options for borrowing planting equipment to prevent large up-front investments.

Additional National & Regional Resources

- 1 **USDA NRCS Cover Crop Economic Tools & Guides**
nrcs.usda.gov/wps/portal/nrcs/main/national/technical/econ/tools/#CropHay
nrcs.usda.gov/wps/portal/nrcs/detail/national/climatechange/?cid=stelprdb1077238
nrcs.usda.gov/wps/portal/nrcs/publications/plantmaterials/pmc/northeast/nypmc/pub
- 2 **USDA ARS Cover Crop Chart**
ars.usda.gov/Main/docs.htm?docid=20323
- 3 **Sustainable Agriculture Research and Education (SARE)**
sare.org/Learning-Center/Topic-Rooms/Cover-Crops
- 4 **eXtension**
articles.extension.org/pages/59454/cover-cropping-in-organic-farming-systems
articles.extension.org/pages/72973/making-the-most-of-mixtures--considerations-for-winter-cover-crops-in-temperate-climates
- 5 **Oregon Tilth: Cover Crop (340) in Organic Systems**
tilth.org/app/uploads/2015/03/Cover-Crop-in-Organic-Systems-Pennsylvania-Implementation-Guide-rd.pdf
- 6 **Cornell University, College of Agriculture and Life Sciences**
covercrops.cals.cornell.edu
- 7 **Pennsylvania State University Extension**
extension.psu.edu/plants/crops/soil-management/cover-crops
extension.psu.edu/pests/weeds/cover-crop-rollers-for-northeastern-grain-production
extension.psu.edu/publications/agrs-124
extension.psu.edu/agronomy-guide
- 8 **University of Vermont Extension**
uvm.edu/extension/cropsoil/wp-content/uploads/UnderCoverGuide.pdf