

# Guide to Growing Cover Crops

Living on  
The Land

Cover crops have been used for centuries to improve soil productivity. Their popularity continues to grow as we expand our understanding of their capabilities.

A cover crop is a temporary, unharvested crop grown to enrich and protect the soil. These crops support several soil health principles, including growing a living root, maximizing biodiversity, and keeping soil covered (Figures 1 and 2). For more information, see *Living on the Land: Soil Health Principles* (EC 1647).

## Planning a cover crop

Before planting cover crops, you should identify your goals for using them. Cover crops benefit farms and gardens by increasing yields and reducing the need for inputs, such as fertilizer and pesticides. In addition, cover crops:

- Protect soil by preventing erosion, relieving compaction, and developing soil structure
- Filter air and water by capturing contaminants, recycling nutrients, storing carbon, and reducing dust emission
- Enrich soil fertility by cycling and releasing nutrients, fixing nitrogen, and adding organic matter
- Store water by increasing water infiltration and holding capacity, moderating soil temperature, and reducing evaporation
- Support biological diversity by providing resources for livestock, insects, wildlife, and soil microbial organisms
- Stabilize ecosystem balance by suppressing pests, diseases, and weeds

For more details on the benefits of cover crops and how to prioritize them, see *Managing Cover Crops Profitably* (3rd edition) from the Sustainable Agriculture Research & Education Program.

## Setting a schedule

Find growing periods during the crop rotation (e.g., in the fall, over winter, in spring before a summer crop, or during an entire growing season) when you can grow a cover crop. Consider restrictions determined by the crops grown before and after the cover crop.



Photo: Garrett Duyck

Figure 1. Spring cover crop of oats, triticale, peas, vetch, turnip, collards, safflower, sunflower, and phacelia following dryland wheat. This cover crop enriched the soil while providing forage for livestock and native bees.



Photo: Garrett Duyck

Figure 2. Winter cover crop of annual ryegrass, turnips, radish, and sugar beet between orchard rows. This cover crop alleviated compaction and provided green mulch that will be mowed and blown onto the tree rows.

## Selecting species

Determine growing-period conditions, including frost risk, water availability, hardiness zone, drainage, shade, soil pH, fertility, and pest control.

A cover crop can be as simple as one species, although more diversity is generally better for overall soil health. Create a list of suitable cover crop species for the growing conditions that best meet your objectives while avoiding excessive expense or complexity.

Choose species that will be compatible with each other but belong to different plant groups (Figure 3, page 2). Under the right conditions, cool and warm season species can be grown together. Include a variety of different plant growth styles: tall and short, wide and narrow, shallow- and deep-rooted. Be careful to avoid species that will cause issues for subsequent crops by spreading disease, harboring pests,

Figure 3. Maximize diversity by including as many plant groups as possible in your cover crop mix

SEASON	Cool Season			Warm Season			
GROUP	Grass	Broadleaf			Grass	Broadleaf	
		Legume	Brassica	Other		Legume	Other
EXAMPLE	Barley	Peas	Radish	Phacelia	Millet	Soybean	Sunflower

becoming a weed, or using too much water. For more information, see *Pacific Northwest Cover Crop Selection Tool and Periodic Table of Cover Crops* from the U.S. Department of Agriculture.

### Establishing a cover crop

Treat your cover crop like a harvestable crop. Plant your first cover crops where you will observe them often. See *Methods For Successful Cover Crop Management in Your Home Garden* for more information.

### Planting

Cover crop seeds can be broadcast or drilled. They can be planted before, during, or after the harvest of the preceding crop. Plant at the depth requirement of the shallowest species in the mix if your equipment cannot plant at multiple depths. Timing of planting is critical because planting too early or late can cause cover crops to fail. For more information, refer to *Using Cover Crops in Oregon* (EM 8704).

### Managing a cover crop

Fertilize and irrigate the cover crop properly to optimize growth and benefit. Much of the nutrition you apply will be available in the future as cover crop residues decompose. Test the soil to detect changes in fertility and adjust fertilizer applications accordingly. See *Estimating Plant-Available Nitrogen Release From Cover Crops* for guidance.

### Terminating a cover crop

Wait to terminate the cover crop until conditions are ideal. Cover crops should be terminated before any species set seed (at about 50% bloom). Termination should be soon enough to recharge soil water, break down cover crop residue, and make nutrients available for the next crop.

You can terminate cover crops using several techniques, including herbicides, livestock grazing, mowing, roll and crimping, winterkill, tillage, or a combination of these methods. Refer to the NRCS publication *Cover Crop Termination Guidelines* for more information.

### Summary

Cover crops are an investment. They can be a sensible solution to many natural resource issues while increasing agricultural production. Cover crops have been shown to be profitable, sustainable, and an essential tool for soil health management.

For assistance planning your next cover crop, contact your local OSU Extension, Soil and Water Conservation District, or Natural Resources Conservation Service.

### For more information

*Living on the Land: Soil Health Principles* (EC 1647) <https://catalog.extension.oregonstate.edu/ec1647>

*Using Cover Crops in Oregon* (EM8704) <http://extension.oregonstate.edu/crook/sites/default/files/oregoncovercrops.pdf>

*Managing Cover Crops Profitably* <http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>

*USDA-NRCS Plant Materials Program's Pacific Northwest Cover Crop Selection Tool* <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/plantmaterials/technical/toolsdata/plant/?cid=nrcseprd894840>

*USDA-ARS Periodic Table of Cover Crops* <https://www.ars.usda.gov/plains-area/mandan-nd/ngprl/docs/cover-crop-chart/>

*USDA-NRCS Cover Crop Termination Guidelines* [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb1263099.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1263099.pdf)

*Estimating Plant-Available Nitrogen Release From Cover Crops* <https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/pnw636.pdf>

*Methods For Successful Cover Crop Management in Your Home Garden* <http://cru.cahe.wsu.edu/CEPublications/FS119E/FS119E.pdf>

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For more information on growing cover crops, contact your local Extension agent, Natural Resources Conservation Service, or Soil and Water Conservation District. Technical and financial assistance is available for landowners wishing to address resource concerns on their property. The phrase "Living on The Land" is used with permission from Living on The Land Stewardship for Small Acreage, © 2008, UNCE/WSARE.

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