Cover Crops for Small Scale Production

NC State University A&T State University COOPERATIVE EXTENSION Stokes County Center

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What Are Cover Crops?

Cover Crop Definition

A crop, such as winter rye or clover, planted between periods of regular crop production to prevent soil erosion and provide humus or nitrogen.

Crops including grasses, legumes, forbs, or other herbaceous plants established for seasonal cover and conservation purposes.

A cover crop is a temporary vegetative cover that is grown to provide protection for the soil and the establishment of plants, particularly those which are slow growing.

NC Winter Cover Crops

Legumes

- Crimson clover
- Red clover
- Hairy vetch
- Austrian winter pea
- Annual white sweetclover
- Yellow sweetclover
- Berseem clover
- Subterranean clover
- White clover
- Fava bean

Non-legumes

- Cereal rye
- Annual ryegrass
- Barley
- Mustard
- Oat
- Oilseed rape
- Forage radish
- Winter wheat

—Picture courtesy of Carolina Farm Stewardship Association; please visit them at carolinafarmstewards.org

NC Summer Cover Crops

Legumes

- Cowpea
- Sunhemp
- Soybean
- Velvetbean

Non-legumes

- Pearl Millet
- German (foxtail) Millet
- Japanese Millet
- Buckwheat
- Sorghum/Sudangrass (Sudex)

Did You Know:

- *Cover crops were used in ancient China, India, and the early Roman Era.*
- *The Latin poet Virgil wrote about cover crops in his epic **The Georgics** in 29 B.C.E.*
- *George Washington and Thomas Jefferson both used cover crops in the late 18th century.*

Horticulture Agent Randy Fulk with Sudangrass as cover crop
-Picture courtesy of Randy Fulk

Selecting Cover Crops

Step 1:

Identify your particular need. Are you trying to fix the Nitrogen (N) in the soil, sequester other nutrients, improve soil tilth, or suppress weeds?

Step 2:

Identify the cover crop that best addresses your needs from step one.

Step 3:

Identify the best time and place to use your selected cover crop:

Winter fallow niche

Time between summer-grown cash crops

Summer niche

Time between spring and fall-grown cash crops

Full year improved fallow niche

This is a longer-term strategy to improve soil health. This process may take one or more full seasons to accomplish.

Example:

Plant hairy vetch or a grass/legume mixture in the fall, terminate it the following spring at flowering, then plant sorghum/Sudangrass. The winter crop provides weed suppression and N for the high N using sorghum/Sudangrass which can produce tons of biomass to build soil organic matter.

Note:

All this hinges on at least some portion of the growing area being out of production at any one time.

Step 4:

If you have questions about the process, need advice, or more resources, contact Horticulture Agent Randy Fulk at Stokes County Cooperative Extension. He can be reached at Randy_Fulk@ncsu.edu or (336) 593-8179.

Information in This Leaflet:

Benefits of Cover Crops

Crimson Clover
-Photo courtesy of
Pender County Cooperative
Extension

"Don't farm naked; plant cover crops!"
-Practical Farmers of Iowa

Cuts fertilizer costs
Some cover crops can sequester nutrients. Legumes (bean family) in particular can fix atmospheric N (N^2) and, when coupled with certain strains of soil dwelling bacteria, convert to ammonia form (NH^3). Plants use this to make amino acids. Host plants supply the developing nodules with carbohydrates as fuel for the process. Nitrogen fixing legumes include red clover, Austrian winter peas, and hairy vetch. Cereal grains such as rye can scavenge N and other nutrients remaining in the soil after the cash crop.

Reduces the need for herbicides and pesticides
Cover crops can help suppress weeds naturally. Root exudates can provide natural herbicidal effects. Cover crops can attract beneficial insects that prey on pest insects.

Suppresses weeds
Allelopathy is the chemical inhibition of one plant (or other organism) by another, due to the release into the environment of substances acting as germination or growth inhibitors, by exudation, leaching, volatilization, and residue decomposition. Rye is particularly adept at this process and makes an excellent weed suppressant and additive for cool-season cover crop mixes.

Improves yields by enhancing soil health
Cover crops increase microbial activity in soils and improve soil tilth allowing for greater root penetration.

Prevents soil erosion
Cover crops reduce, or eliminate, the amount of time the soil is bare. Bare soils increase erosion risk and lead to soil compaction.

Conserves soil moisture
Cover crops cover the soil and reduce evaporation and water loss.

Protects water quality
Cover crops reduce runoff from agricultural fields, thereby reducing the risk of fertilizers in waterways.

Helps safeguard personal health
By reducing reliance on agrochemicals, cover crops represent a potential reduction in healthcare costs.

Winter Rye Measuring 36" high
-Photo courtesy of
University of Vermont
Cooperative Extension

Buckwheat
-Photo courtesy of
Cornell University
College of Agriculture and
Life Sciences

Cover Cropping in Small Spaces and Home Gardens

Is it worth the effort?
Yes, but know that it may be more difficult to manage with larger machinery. Home gardeners may have to adjust their processes to better accommodate their space. For instance, debris from cover crops can be left on the bed to decompose and gardeners can then use a no-till planting method for the next crop.

Cover Crops in Raised Beds
Raised-bed gardeners will reap the same benefits as larger farmers, but they may encounter more difficulties due to space limitations.

Considerations for Home Gardeners
- Spent plant material may require chopping or cutting by hand into smaller sizes.
- Large terminated crop debris may clog smaller tillage equipment, such as a Mantis.
- Spent cover crop debris may have to be manually incorporated into the soil.

Cover Cropping the SEEDS Garden

October 20

Horticulture Agent Randy Fulk and the Stokes Extension Master Gardeners will be sowing cover crops in their community garden at Recreation Acres in King, NC. The garden is named the Stokes Educational Exploration Dirt Spot or SEEDS and is maintained by the Master Gardeners.
Today, Fulk and the Master Gardeners will be sowing Austrian winter peas and winter rye.

Austrian Winter Peas (AWP)

This winter annual is also known as field peas, black peas, Canadian field peas, or spring peas.

Sow in fall or early spring, not heat tolerant, but has good winter tolerance- down to 10°F for the hardiest varieties.

Good N fixer, as high as 90–100lbs N per acre.

Generates a lot of biomass, as much as 4,000–5,000 lbs. per acre and can do this in dry conditions.

Residue is not long-lasting; biomass breaks down quickly which may be an advantage for incorporating into a raised bed.

Middle of the scale as a soil builder and a weed fighter.

Grows fast and will climb, hence the winter rye companion.

Good for grazing.
Long term blooming which provides an early and extended source of nectar for honeybees.

Sow at 60—80 lbs. per acre, in late fall or early spring, you only need a very small quantity for a typical raised bed.

Winter Rye

This cool season annual, also known as cereal rye, grain rye, or rye, is a great companion for Austrian winter peas because the peas will climb up the stalks of winter rye.

Best cool season cereal grain for absorbing unused soil N, as much as 25–50 lbs. per acre and can hold this N until spring.

Brings Potassium (K) up from the lower soil profile and increases the concentration of K near the surface.

Fits in with many crop rotations with staple crops: before or after soybeans, corn, or vegetables.

Winter rye is a good soil builder, erosion fighter and weed suppressor. It is fast growing and can be used as a forage crop.

Generates lots of biomass, as much as 3,000–10,000 lbs. per acre.

Residue is long lasting and makes a good cover for a subsequent no-till crop. This feature may work against a raised bed application but could still be used in a no-till process.

Attracts large numbers of beneficials, especially lady beetles.

Helps reduce root knot nematodes.

Good weed suppression because of its strong allelopathic properties against small-seeded, light sensitive weed species such as – lambsquarters, redroot pigweed, velvetleaf, chickweed, and foxtail. (Allelopathic properties are not a factor sowing with AWP due to seed size.)

Sow in late summer through late fall and is slightly more heat tolerant than AWP.

Sow at 60 – 100 lbs. / A
Again, only need a handful or so for a typical raised bed.

Cover Crop Resources

Connor, Cindy (2008). Cover crops and compost crops in your garden. Ashland, VA: Homeplace Earth.

Sustainable Agriculture Research and Education Program (2007). Managing cover crops profitably. College Park, MD: Sustainable Agriculture Research and Education Program.

Extension Master Gardener
NC COOPERATIVE EXTENSION

Visit us on the web at:
stokes.ces.ncsu.edu/master-gardeners/

"Might as well cover crop because, 'Mother Nature likes to keep things green, so will provide her own weed seeds to fill in the space if you don't'".
—Cindy Connor, Founder Homeplace Earth homeplaceearth.com

Austrian Winter Peas
-Photo courtesy of Midwest Cover Crops Council. Visit them on the web at mccc.msu.edu