

ROTATION/NO TILL

The biodiversity you bring into your system with good crop rotation delivers many benefits, including improved yields, reduced and often prevented disease transmission, insect control, weed suppression, soil nitrogen management, improving soil tilth and structure, improved water utilization and reduced soil erosion. Cover crops are key in any rotation and, in the case of organic farming, are often the underlying drivers of the system.

For no-till rolling of cover crops, consider the amount of biomass that the cover crop can potentially produce and its typical flowering date in the spring to determine the kill date that will be most effective for rolling mechanically. If you roll too soon - you may get both less biomass and an ineffective kill, since the crop is still in the vegetative state.



Killed and rolled hairy vetch mat provides nitrogen and weed suppression to no-till corn

GRAZING/FORAGE SYSTEMS

Most cover crops can be grazed or harvested for forage. When harvesting or grazing cover crops, the same rules apply as for growing any forage. Manage for fertility and weed control. Treat your cover crop as you would treat your main crop. Make sure to harvest before bloom or heading, when quality is optimal. For small grains, this is frequently flag leaf or boot stage. Some crops have a far narrower harvest window than others, and should be watched carefully. It's best to plan ahead, but most cover crops can also be used as emergency forage in a dry year, or to extend pasture acreage if needed.

If planted solely as a cover crop and not for forage or grazing, the crop can be established at a lower seeding rate, and either incorporated as a green manure or chemically killed. Alternatively if the cover crop is intended as a rolled down weed-suppressing mat or as a mowed mulch cover in the spring, then higher seeding rates are recommended to produce heavy amounts of biomass for this purpose.

Small grains, brassicas, legumes, or grass can serve many benefits for the soil before providing high-quality forage in the spring. When grown as a double crop, however, additional fertility and a higher seeding rate are usually needed. In addition, keep in mind that nitrogen credits are minimized greatly from legumes if they are harvested or grazed instead of being incorporated into the soil.

BENEFITS OF COVER CROPS

- Improve Soil Health
- Prevent Soil Erosion
- Break Hard Pan
- Nitrogen Fixation
- Nitrogen Scavenging & Nutrient Cycling
- Reduce Surface Crusting
- Soil Disease and Pest Suppression
- Add Active Organic Matter to Soils

COVER CROPS IN ANY SYSTEM

Cover crops can be adapted to almost any farming system in which you have a window to grow an additional crop. The rewards are similar in most rotations; cover crops have a variety of soil benefits that apply to most cash crops. In any scenario, including an intensive vegetable rotation, they help restore valuable nutrients and organic matter to the soil as well as suppressing weeds and pests. The crop or mix has to be engineered to fit into the rotation, and King's agronomists have the expertise and experience to help you find the right cover and planting window for your needs.



Cover crops can be used between plastic in vegetable production. This customer plants buckwheat between his strawberry rows following harvest season to feed pollinators, and keep weeds suppressed.



Designing
Cover Crop
Programs



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USING COVER CROPS

Whether you are farming conventionally, using no-till or farming organically, soils should have a living crop growing on each field for as many months as possible.

Cover crops gain popularity every year, as more producers discover that they can improve soil health and water quality while meeting a variety of other needs on the farm. The plant material builds soil organic matter and provides a habitat for microorganisms, which in turn helps to cycle nutrients. These functions mean greater resilience in the face of many of the inherent risks of farming, including droughts and flooding. If soil is covered year-round, it is also less vulnerable to erosion and runoff. Anchoring and shielding the soil with cover crops is a simple step to preserve topsoil, the most important resource on any farm – renewable, but one that regenerates at a glacial pace if lost. By covering the soil and reducing runoff, cover crops can also improve the water quality in nearby waterways and for all those living and farming downstream.



Remember the importance of developing a program that works for you. King’s staff, along with our dealer network, is happy to help you create programs that meet your farm’s unique needs.

COVER CROP COCKTAILS

Cover crop mixtures are an excellent way to build resilience through biodiversity, since some species can take over if others are struggling or dying out. Working with mixtures provides flexibility, ensuring that the unique needs of your location, soil and crop rotation are met.

FEATURED MIXES

BROADCASTER - Annual ryegrass, crimson clover, common medium red clover, daikon radish and yellow sweet clover. Broadcast by hand, ATV seeder, highboy seeder, etc, in late summer with moisture. Broadcaster is also great for interseeding into corn and other crops.

RAY’S CRAZY FAMILY OF MIXES - Diverse multi-species mixes that build soil by combining the benefits of grasses, legumes and brassicas. Also make excellent grazing mixes. Ray’s Crazy comes in Spring, Summer and Fall formulations.

CARGO - Combines Crimson Clover, Annual Ryegrass, and Oats. Great winter annual mix for southern PA and farther south. Crimson Clover flowers early, fixing nitrogen earlier in the spring than other legumes. Annual Ryegrass has very extensive root growth and improves soil structure better than cereal ryes.

TERRALIFE PROGRAM - A series of diverse mixes designed for specific crop rotations and to perform specific goals. These contain both winter-killed and winter-hardy species.

3-WAY CLOVER - A Red, Ladino, and Sweet clover mix that can be frost, spring, fall or aerial seeded, or broadcast at last cultivation of corn.

SUMMER SOLAR MIX - A blooming mix of buckwheat, cowpeas, sunflower, and sunn hemp that attracts beneficial insects and pollinators. All species are broadleaves, with excellent competition against weeds and deep taproots for nutrient uptake.

INDIVIDUAL COVER CROP SPECIES

Spring Oats	Quick grower in the cool weather; good for grazing or harvest as baleage, excellent presummer weed-suppressing cover. Universal nurse crop—oats can be planted in the spring or in late summer in mixes with slower growing perennial legumes (clovers or alfalfas) or brassicas. They are a quick scavenger of soil nitrogen, and will recycle soil nitrates quickly in late summer before the other slower growing winter annuals get started. They provide a quick soil cover to prevent erosion.
Annual White Sweetclover	It blooms and sets seeds in the planting year. Its value is largely in its soil health benefits (including nitrogen fixation) and its ability to attract pollinators with its abundant nectar production. Long flowering period and day-long nectar production.
Sunn Hemp	Tall-growing summer annual legume, tolerates dryer conditions, high biomass producer; good smother crop. Use as a green manure/cover crop to provide both organic matter and nitrogen during the period between summer and the winter cash crop. Produces significant biomass in 6-7 weeks. High lignin content; after 3 to 4 weeks of growth it gets too woody for forage use. Good in mixes to add varying heights to the cover, but keep seeding rate low.
Cow Peas	Productive heat tolerant vining summer-annual legume. Excellent drought resistance combined with good tolerance of heat, low fertility and a range of soils. If left to bloom it attracts many beneficial insects that prey on other pests and also produces extrafloral nectaries from the leaves. Slow to start, so it does well in mixes with other quicker growing species, especially those that are erect-growing that can serve as a trellis to support its growth. Works well as a forage, especially in a mix. Same as black-eyed peas - beans produced can be used for human consumption.
Peredovik Sunflowers	Soil benefits -strong taproots penetrating vertically downward, widely spreading branch roots; enlarged taproot eventually grows many laterals. High biomass producer; tall growth and beautiful large blooms, which attracts pollinators and beneficial insects. It can be grown as a wildlife shelter and forage (bird seed) left to stand into the fall/winter.
Non-BMR Sorghum Sudangrass	Low cost, fast-establishing, non-BMR sorghum-sudangrass. Higher-producing than most BMRs. Adds organic matter to worn-out soils. Fast growing, heat loving, smothers weeds, suppresses nematodes, penetrates compacted subsoil.
Buckwheat	True “smother crop” since it grows a thick canopy quickly and out competes summer weeds. Good quick fill-in in rotation between spring and summer or early fall crop, reseeds itself, but easy to kill. Good addition of broadleaves, especially in a mostly grass-based rotation. Fibrous root system, soil conditioner loosens up soil, makes org. Phosphorous available. If left to bloom attracts pollinators (beneficials).
Daikon Radish	Deep tap root growth, penetrates soil, improves tilth, scavenges and bio-accumulates nitrogen. calcium, sulfur and magnesium, from lower soil levels and moves them up to upper soil profile, weed suppressor, suppresses nematodes.
Crimson Clover	Winter annual clover; in the early spring faster biomass and nitrogen production than other clovers, beautiful deep crimson bloom. Flowers attract many beneficial insects. Works well in combination with a small grain or with annual ryegrass as a cover crop or high quality nutritious forage mix.
Hairy Vetch	Vining winter annual legume, high biomass producer. If left to grow into May it will fix significant amounts of Nitrogen. Good for rolling as a weed-suppressing mat before planting a summer annual nitrogen feeder like corn or sorghum.
Cereal Rye	A traditional staple cover/forage crop for rotations with corn grain and soybeans, as it is the hardiest cover crop. Establishes well in mid-fall. Best option to use for late planting. Good biomass producer and weed suppressor; known to secrete chemicals that help prevent weed seed germination.