



Summer Solar Mix

A diverse legume-forb cover crop mix of aggressively growing summer annuals, with possible dual use as a wildlife food plot. The mix includes four very different components—buckwheat, cowpeas, sunflower, and sunn hemp. These species work together to perform several functions during their brief growth period:

- Nitrogen fixation and recycling
- Organic phosphorus liberation and recycling
- Soil organic matter building/ carbon sequestration
- Other nutrient cycling and soil health building
- Summer pollinator and beneficial insect attraction
- Summer weed smother crop
- Disease and nematode break crop



Summer Solar Mix 18 days after planting. Its broadleaves grow a thick canopy for weed suppression early

Both conventional and organic growers will find this a useful break crop in between spring and fall crops that builds soil nitrogen levels and attracts pollinators and other beneficial insects. It can also be used in farmscaping strips to draw beneficials throughout the season.

Other summer annuals can be combined with this mix if more diversity is desired, such as sorghum-sudan, millet, or brassicas.

Establishment: It's best to drill the mix, but can be broadcast on well-worked ground and packed in to cover the seed well. 50-70 lbs/A is recommended, but use higher seeding rates as a fast shorter-season summer smother crop, if you plan to rotate out sooner.

Ideal planting window is early June through summer, after all chance of frost has passed and soil temperatures have reached 65 degrees F and rising. Successful germination at later summer planting dates in July and August will depend on adequate soil moisture.



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High Energy Forages and Soil Building Cover Crops

At A Glance

- Cover Crop mix with flowering species that attract pollinators and many other beneficial insects
- Not recommended as a forage, but can be used for wildlife food plots
- **Summer soil health builder** that works well in rotation before fall planted crops, such as garlic or small grains (wheat, barley, triticale, winter spelt or winter cereal rye) or in a shorter rotation before late summer planted vegetable crops.
- Broadleaves suppress weeds early on
- **Summer nutrient cycling**—cycles nutrients during the summer months, and root exudates also make nutrients that are tied up in the soil more available for the next crop in rotation.

Product Formula

Cowpeas-Iron Clay—66.67%
Buckwheat "VNS" - 11.11%
Sun Hemp "VNS" - 11.11%
Peredovik Sunflower - 11.11%

Best Uses

Break crop; soil building and nitrogen fixation before small grain or vegetable crops; summer pollinator & beneficial insect attraction; summer weed smother crop, wildlife food plot

Establishment

Dates: Late spring to early summer; as soon as soil temperatures are 65 degrees F and increasing

Seeding Rate: 35-60 lb/A

Depth: 1/2—3/4"

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Dates: June- July - August, depending on region, temperature, and soil moisture (use in early August as a quick growing, shorter-lived break crop)

Seeding Rate: 35-60 lb/acre (higher seeding rates accomplish quicker weed smothering, biomass production and nutrient recycling).

Depth: 1/2" to 3/4"

Each component performs a unique function:

Buckwheat: A rapidly growing broadleaf cover crop that outcompetes summer annual weeds and builds soil in short windows between warm season crops, or in the transition periods between winter annuals and summer annuals. It extracts phosphorus and makes it more available to the following crop. Its fibrous root system improves soil quality in the upper soil profile, increasing short-term soil aggregation and tilth. Blossoms attract beneficial insects such as bees and other predators, including hoverflies, predatory wasps, insidious flower bugs that attack or parasitize aphids, mites and other pests.

Cowpeas: Iron Clay Cowpeas are a vining summer annual legume, and the beans it produces are also known as black-eyed peas. In a straight stand, cowpeas form a dense weed suppressing mat and fix nitrogen. Blossoms attract beneficial insects. Iron Clay Cowpeas reduce root-knot and soybean cyst nematode populations, making them a beneficial break crop in rotation.

Besides its flower nectaries, Iron Clay Cowpeas also have "Extrafloral nectaries" which are nectar release sites located on the petioles and leaflets that attract beneficial insects including ants, many types of predatory wasps, honeybees, lady bird beetles, and soft-winged flower beetles.

The cowpeas are tolerant of heat and drought and can be grown on poor soils. Due to the fact



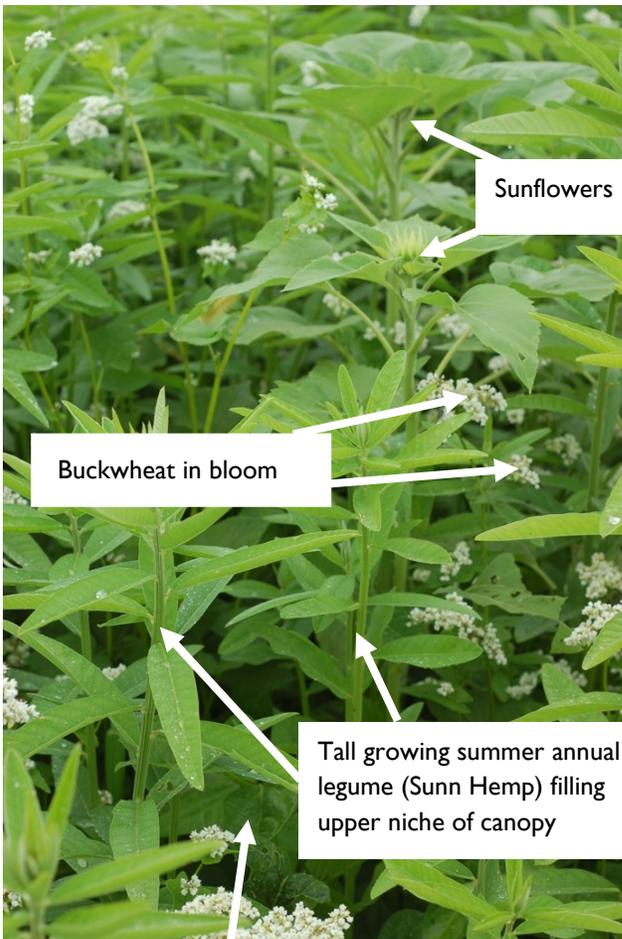
Neck-deep Summer Solar Mix in the experimental stages, with buckwheat in bloom.

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they are somewhat shade tolerant, they work well in cover crop mixes, growing under the canopy of the taller species.

Cowpeas grow a deep tap root that helps the plants find deeper soil moisture; in addition, it fixes nitrogen as a legume and it also scavenges phosphorous, bringing it upward into its above ground biomass for recycling and reuse by subsequent crops. The taproot system also helps build soil structure.



Sunflower: For general cover crop use, sunflowers produce lots of biomass, but become lignified and woody at an earlier maturity stage than other species, and are only suitable as forage while still in the vegetative state. They draw bees, beneficial insects, butterflies, and birds to the field, which boosts overall biodiversity. Strong taproots penetrate vertically downward with widely spreading branch roots, and the enlarged taproot eventually grows many laterals. The root system recycles nutrients and puts organic matter back in the soil, contributing to improved soil health. The ample above ground growth contributes to overall biomass production.

Sunn Hemp: A tall summer nitrogen-fixing legume that gets quite fibrous and lignified prior to bloom. It can reach six feet in height, and its deep taproot has many lateral branches. It is a high biomass producer that's competitive with weeds. Above ground biomass accumulates significant amounts of carbon, which eventually adds to soil organic matter levels when incorporated or left as a heavy surface residue. Sunn hemp can also be used as a rotational break crop for suppressing plant parasitic nematode populations in both vegetable and field cropping systems. It uses various modes of action to do this, making it an efficient crop for nematode management. It

is not only a poor host, or "non-host" to many plant-parasitic nematodes, but it has been shown to produce toxic compounds that work against several key nematode pests.

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Farmscaping With Pollinator Mixes

Most row crop fields are acres upon acres of monoculture. If these crops are grown to bloom stage, these flowers will provide food for vitally important pollinators like honeybees for a very short time, and the single plant species creates food for limited insect species. **You can use mixes of flowering annuals (like Summer Solar Mix) or perennials to create a refuge on the farm to attract diverse species of predatory insects, praying mantises, honey bees, ladybugs, birds, and butterflies.** Although many farmers want to build organic matter and soil health with this mix, others will use it primarily for attracting these beneficial species during the summer months.

There is no one right way to do this, but the larger the area, the better. At least 1-2 acres of farmscaping per 25 acres of cropland will give you the most benefit. Large, square blocks are the easiest to maintain in terms of edging, weed maintenance, or planting around the edges.

In reality, many configurations will work and what you choose depends on your management, field layout, and topography. Long corridor strips between fields may be the most practical layout.

Most farms have odd-shaped parcels of land that are not easy to bring equipment into for planting and harvest, and these make good areas to dedicate permanently to pollinator crops. These may include small, awkward wedges between a field and a portion of the creek or woods, waterways, hedgerows, diversion strips, farmed terraces, and other fragile areas that are best left alone for the duration of the season. Long contour strips could also be taken out of production and planted to a summer annual mix like Summer Solar Mix. They could be more permanent or rotated with other crops.

This is also well-suited to produce operations, since pollinator plantings can be rotated between the vegetable rows each season. These vegetable systems would also benefit from planting the mix around the perimeter of a greenhouse—both to reduce mowing needs and to draw beneficial insects to the crops planted inside.

In monoculture fields with limited bloom there are few natural predatory controls, so pests such as moths and their lepidoptera offspring may begin to dominate the area. **Farmscaping draws beneficial predators into adjacent areas so they can begin to move into the field to prey on these pests.**

Pollinator plantings also make great buffers and transitional zones. For example, planting corn or soybeans right up to the edge of a wooded area won't be the best idea since the field edges will get shading from the trees and be vulnerable to wildlife in the forest. A pollinator mix planted at the woodline eases this sharp transition and also helps draw beneficial insects out of the woods and into the field.

Summer Solar Mix is convenient in many rotations. Consider the following request from a Western New York farmer:

"We are looking at possible cover crops to plant after the spring peas are harvested mid to late June prior to seeding winter wheat. Last year we had the opportunity to grow a crop of BMR sorghum Sudan for a dairy operation after the peas (19.5 green chop tons per acre). Looking for other options if that opportunity is not available again. Do you have any suggestions?"

Summer Solar Mix fits well in this particular situation as both a rapid soil builder and insect bio-diversity builder. It is appropriate here to plan it into the normal rotation for temporary farm-scaping rather than placing it in a specially sanctioned area. Both can be done on the same farm, however.

This plan will be different on every farm, and each farmer is likely to know best where these plantings will offer the best fit and benefit. The most important thing is to first have an understanding of the benefits, and the desire to take advantage of them.