GREEN SEED AG.com
''Building & Maintaining Healthy Soil''

What Benefits Do Cover Crops Have On Your Soil

Annual Ryegrass- The massive root structure makes it the ideal cover crop when wishing to increase soil structure and promote water infiltration and also drainage. The aggressive roots break through the different layers and compaction layers of the soil, making it easier for the roots from the cash crop to locate the water in the drier months of the growing season. The deep roots are also accredited for bringing nutrients that have leached through the soil, back up to the cash crop root zone in order to better utilize those nutrients. Since 60% of our organic matter comes from the roots, annual ryegrass also is very good at increasing soil organic matter content. It is also an excellent choice for helping minimizing erosion. Annual ryegrass also has excellent forage and grazing values. When managed properly it can extend the grazing period late into the fall and early into the spring before the heat starts to appear in June.
Seeds Per lb: 170,000
Grass & Cereal: Cool Season
Minimum Germination Temp: 40 °F
Emergence Time: 14 days
Drill: 8 – 15 lbs. per acre
Broadcast With Light Incorporation:
8 - 15 lbs. per acre
Aerial Or Surface Seeding: 15 - 20 lbs. per acre

Barley Winter- Winter Barley is an excellent choice when reclaiming abused and eroded land. The plant height will range from 1.5- 3 feet tall. The winter barley roots achieve good depths and are excellent at supporting mycorrhizal fungi, as well as tolerate sodic soils. Winter barley does provide excellent high-quality forage as well as erosion control, nutrient scavenging, and soil building benefits. It should be noted that winter barley is not as winter hardy as Cereal Rye or Triticale.
Seeds Per lb: 13,600
Grass & Cereal: Cool Season
Minimum Germination Temp: 38 °F
Emergence Time: 6 – 8 days
Drill: 45 – 75 lbs. per acre
Broadcast With Light Incorporation:
50 – 83 lbs. per acre
Aerial Or Surface Seeding: 55 – 90 lbs. per acre

Cereal Rye- Cereal rye is the hardiest of all cereals. It has a wider planting date than other cover crops which allows it to be planted later into the fall. The cereal rye also has an extensive rooting system that is excellent at preventing erosion and holding the soil in place. The roots provided by the rye increase nutrient cycling and allow the cereal rye to be excellent at capturing unused nitrogen and holding it for a long period of time if allowed to reach full plant growth. Cereal rye also increases the concentration of exchangeable potassium near the soil surface, by bringing the potassium up from the lower soil profile. With the cereal rye growing from three to six feet in height, the amount of bio-mass left on the surface provides excellent weed suppression qualities. Cereal rye is being used extensively to control resistant weeds in the south that have become virtually impossible to control with chemical programs. The blanket of bio-mass left on the surface not only provides weed suppression but is also very beneficial to the soil and the following cash crop. It protects the soil from wind and water erosion, provides a cushion barrier between the soil and the rain drops, and also helps disperse the weight of the equipment as it moves across the soil surface, thus helping reducing compaction. Cereal rye works as a pest suppressor as well, by helping reduce root-knot nematodes and other harmful nematodes. In the spring time, if left actively growing the cereal rye can assist in drying out wet soils. However if terminated and allowed to fall down before planting the soils will struggle to dry out. So it is not uncommon to plant the cash crop then kill the cereal rye immediately after planting. Cereal rye rates high in all categories when measuring benefits of a cover crop, with the exception of being able to produce nitrogen; however it is an excellent nitrogen scavenger.
Seeds Per lb: 18,200
Grass & Cereal: Cool Season
Minimum Germination Temp: 34 °F
Emergence Time: 5 – 8 days
Drill: 45 – 90 lbs. per acre
Broadcast With Light Incorporation:
50 – 99 lbs. per acre
Aerial Or Surface Seeding: 55 – 108 lbs. per acre

Orchard-grass- Orchardgrass is usually easy to establish in either early spring or late summer. There is increased risk of winter injury with summer seedings made after mid-August. Seed at the rate of 8 to 12 lb per acre. When seeding in combination with legumes, orchardgrass seeding rate should be reduced. Orchardgrass should not be seeded with other grasses because of differences in m aturity and palatability. Seed ¼-to ½-inch deep into a well-prepared seedbed and can be accomplished with band seeders, cultipack seeders, grain drills, or by broadcast seeding. Since orchardgrass is a high-quality grass, it can be grazed by most classes of livestock. Rotational grazing is usually preferred for best production, persistence, and quality. Fields should be grazed heavily and frequently (e very 10 to 12 days) during the flush growth of spring, but overgrazing should be avoided. Leave a 3-to 4-inch stubble so the grass can recover quickly. Heavy grazing during October can lead to depleted root reserves and increased winter injury.
Seeds Per lb: 540,000
Grass: Cool Season
Minimum Germination Temp: 65 °F
Emergence Time: 14-21 days
Drill: 8-12 lbs. per acre
Broadcast With Light Incorporation:
12-15 lbs. per acre
Aerial Or Surface Seeding: Not recommended

Japanese Millet- Japanese Millet is a warm-season annual grass commonly grown for forage. It grows up to 5' tall and has a slightly coarser stem than other hay millets. It is extremely quick growing and can be ready to cut for hay within 50 days of planting. It also displays good regrowth persistence in a multi-cut haying or grazing scenario. Japanese millet can be easily cured for hay and will have forage quality similar to other millet or small grain hay. It has much better tolerance to flooding than other summer annual forages and can grow in heavy, wet soils. Japanese Millet also has a higher level of saline tolerance than other millets.

Seeds Per lb: 155,000
Grass & Cereal: Warm Season
Minimum Germination Temp: 65 °F
Emergence Time: 7 days
Drill: 10 – 15 lbs. per acre
Broadcast With Light Incorporation:
11 – 17 lbs. per acre
Aerial Or Surface Seeding: Not recommended

Pearl Millet- Pearl Millet is an upright summer annual bunchgrass. The heads of the pearl millet resemble that of a cattail. It too is best suited for mid-summer plantings. The pearl millet has good nitrogen scavenging qualities, prevents erosion, and also does a good job of suppressing weeds in the summer. As far as grazing and forage is concerned, the pearl millet is better suited for such things as oppose to the Japanese millet. When pearl millet experiences mowing mid-season it will rapidly increase root mass. It is highly palatable and does not produce Prussic Acid. Pearl millet is drought tolerant, but under optimal weather conditions it can be ready to graze in 35-40 days.
Grass & Cereal: Warm Season
Minimum Germination Temp: 65 °F
Emergence Time: 7 days
Drill: 10 – 15 lbs. per acre
Broadcast With Light Incorporation:
11 – 17 lbs. per acre
Aerial Or Surface Seeding: Not recommended

Sorghum Sudangrass- Sorghum-Sudangrass is an excellent option when additional forage is needed. It is capable of achieving heights of up to 8 feet. Sorghum-Sudangrass has excellent heat and drought tolerances. There are several varieties available depending on the task at hand. It should be noted not to graze until the plant has reached at least 18-36" in height. Sorghum-Sudangrass can pose prussic acid poising hazard for livestock when the plants are stressed by drought or freeze. Nitrate toxicity may also pose a problem in drought stressed plants. When Sorghum-Sudangrass is mowed or grazed down to 6+" in height this greatly increases root development and tillering, making it a good option for soil building as well in a non-livestock operation. It can also be used in a mix to shelter other covers from the frost.
Seeds Per lb: 15,000
Grass & Cereal: Warm Season
Minimum Germination Temp: 65 °F
Emergence Time: 10 days
Drill: 15-30 lbs. per acre
Broadcast With Light Incorporation:
17-33 lbs. per acre
Aerial Or Surface Seeding: Not recommended

Spring & Winter Oats- There are two different types of oats that are widely used in the market today. Spring oats and winter oats, both of which are credited to be one of the best nurse crops we've discovered in the cover crop industry. Spring oats are planted in the fall when winter termination is desired. Spring oats are very quick to establish and do an excellent job of suppressing weeds as the main cover crop becomes established. Addition of spring oats is an almost always a must when seeding clovers to ensure excellent winter survival of the clover. This is due to their rapid growth in the fall creating an insulation blanket over the young clover protecting it from the harsh winter winds and temperatures. Spring oats will usually survive until we experience two to three days of mid 20's degree temperatures. Spring oats are an excellent addition to any fall grazing mix. Winter oats are planted in the fall when winter termination is not desired. Fall growth is not as fast as spring oats. There is still possible winter termination if they are not planted in a time frame that will allow sufficient fall growth. There are very few variety options when we are talking about winter oats usually come at a higher cost than spring oats. Both spring and winter oats are excellent additions to any mix and have shown to address any heavy metals in the soil.
Grass & Cereal: Cool Season
Minimum Germination Temp: 38 °F
Emergence Time: 5 – 8 days
Drill: 30 – 60 lbs. per acre
Broadcast With Light Incorporation:
33 – 66 lbs. per acre
Aerial Or Surface Seeding: 36 – 72 lbs. per acre

Teff Grass- Teff originated in Ethiopia. Teff grass has the ability to thrive in moisture stressed and water logged soils, drought conditions and poorer soils, It is also useful for suppressing weeds and fast growing. Teff in the USA is grown primarily as a forage crop for livestock, is adaptable and it can grow in various environments. It is a fine stemmed, fast growing, high yielding, summer annual grass. But what really makes Teff Grass unique and exciting is its nutrient content. Teff is a "C4 Warm Season" grass with a moderate protein and calorie content, but with a low sugar/starch content. Teff is an ideal forage and hay crop due to several factors – Palatability - Teff is fine stemmed, leafy and soft which is very palatable to horses. Low Sugar Solution - The high fiber, low sugar and starch content make this a rescue feed for horses suffering from many, and some debilitating, disease conditions. Anti-Nutritional Factors - Teff does not have the anti-nutritional compounds like nitrate toxicity and prussic acid that sometimes occur in other grasses. Fast Growth - Under ideal growing temperatures and moisture, Teff germinates quickly and is ready for early harvest in 45 to 55 days after seeding. Wide Adaptation - Teff has the ability to thrive in moisture-stressed and waterlogged soils. In areas without irrigation, Teff can provide forage during times of drought. Versatility of Harvest - Although in most instances Teff forage is baled as dry hay, it can be grazed as well.
Seeds Per lb: 1.3 million
Legume: Warm Season
Minimum Germination Temp: 65 °F
Emergence Time: 4-5 days
Drill: 8-10 lbs. per acre
Broadcast With Light Incorporation:
10-12 lbs. per acre
Surface Seeding: *Not recommended*

Timothy Grass- The benefits of Timothy grass are numerous. It has broad appeal as hay for and horses, but when combined with alfalfa, it makes nutritious forage for sheep and other grazing animals. It is also made into food for guinea pigs, rabbits and other domesticated pets. The plant is easily recognized when it blooms by its long narrow seed head. When does Timothy grass bloom? The inflorescence is produced in late spring to early summer or within 50 days of sowing. The plant can be harvested for hay several times during the growing season if planted in early spring. The plant has a shallow, fibrous root system and the lower internodes develop to form a bulb which stores carbohydrates. The leaf blades are hairless, smooth and pale green. Young blades begin rolled and mature to a flattened leaf with pointed tip and rough edges. Each leaf may be 11 to 17 inches (27.5-43 cm.) long. Seed heads approach 15 inches (38 cm.) in length and have spiky florets that become tiny seeds. Large perennial stands of Timothy grass growing in fertile lowland fields is a common sight in many states. Timothy grass is generally sown in spring or summer. It takes 50 days to establish for harvesting in most climates. The best time to plant late crops is six weeks or more prior to the first fall frost, which gives the stand enough time to establish before cold weather. Sow the seeds in amended soil that has been tilled. Although Timothy grass grows in most soil types, the pH of the soil is important. Ideally, it should be between 6.5 and 7.0. If necessary, perform a soil test and amend soil with lime six months before planting the crop. Seeds should be planted ¼ to ½ inch (0.5-1.25 cm.) deep and lightly covered with soil. Keep the soil moderately moist. Timothy Grass Care This grass doesn't do well in areas with excessive heat or in drought conditions. Consistent moisture is a must to develop a good stand. Often, Timothy grass is planted with legumes as nutritious forage for animals. The benefits of Timothy grass in this instance as tillage are increased nitrogen, percolation, drainage, and added nutrients.
Seeds Per lb: 1,152,000
Grass: Cool Season
Minimum Germination Temp: 65 °F
Emergence Time: 7-14 days
Drill: 8-10 lbs per acre
Broadcast With Light Incorporation:
10-20 lbs. per acre
Aerial Or Surface Seeding: *Not recommended for aerial seeding.*

Austrian Winter Pea- Austrian Winter Peas are a legume capable of producing up to 150 lbs. of Nitrogen. Austrian Winter peas are an excellent option to add to any mix that may be used for forage. Most often they will winter kill when temperatures fall below 18 degrees Fahrenheit when there is no snow cover. They do not tolerate water logged soils.
Seeds Per lb: 1800
Legume: Cool Season
Minimum Germination Temp: 41 °F
Emergence Time: 9 days
Drill: 30 lbs. per acre
Broadcast With Light Incorporation:
55 – 88 lbs. per acre
Aerial Or Surface Seeding:
Not recommended for aerial or surface seeding.

Crimson Clover- Crimson clover is an excellent choice in front of corn due to the potential nitrogen produced. With the capability of producing 140+ lbs. of nitrogen, many growers like to utilize this plant in mixes. Its winter survival and spring performance is best achieved when spring oats are seeded in the fall with the crimson clover to protect the clover from the harsh winds in the winter. Crimson clover is not well suited for soils that are prone to holding water, or may have water go over the top of the soil.
Seeds Per lb: 149,000
Legume: Cool Season
Minimum Germination Temp: 42 °F
Emergence Time: 7 – 10 days
Drill: 12 – 15 lbs. per acre
Broadcast With Light Incorporation:
15 – 18 lbs. per acre
Aerial Or Surface Seeding: 15 – 18 lbs. per acre

Berseem Clover- Berseem Clover is a good option for any operation that is looking to sequester Nitrogen and or graze their crop. Berseem Clover is listed in the warm season category but can be fall seeded in the southern half of the United States. One of the key features to this crop is that it is a non-bloating clover. Also, Frosty has an impressive root structure and can survive temperatures down to 5 degrees Fahrenheit without snow cover. It is a late maturity clover and has shown to produce 150+ lbs. of Nitrogen. Berseem Clover is also a good option for spring interseeding as well.
Seeds Per lb: 134,000
Legume: Warm Season
Minimum Germination Temp: 42 °F
Emergence Time: 7 days
Drill: 10-15 lbs. per acre
Broadcast With Light Incorporation:
15- 20 lbs. per acre
Aerial Or Surface Seeding: 20-25 lbs. per acre

Buckwheat- Buckwheat is a fast growing plant that has a large amount of fine roots that are excellent at working the soil and also capturing phosphorus, and makes the phosphorus available to other plants. It is an excellent weed suppressor and attracts many beneficial insects. It thrives in poor soils and is often the first crop to be planted on freshly cleared ground and over-farmed soils. It is to be noted that buckwheat can reseed its self in a very short window if allowed to go to seed. It is best to terminate 45 days after planting to avoid this if reseeding is not desired.
Seeds Per lb: 18,000
Season: Cool
Minimum Germination Temp: 50 °F
Emergence Time: 3 – 7 days
Drill: 20 – 35 lbs. per acre
Broadcast With Light Incorporation:
22 – 39 lbs. per acre
Aerial Or Surface Seeding: 24 – 42 lbs. per acre

Hairy Vetch- Hairy Vetch is the go-to crop when nitrogen production is at the top of your list for goals to achieve. By having the capability to produce 200+ lbs. of nitrogen, very few legumes can come close to the benefits hairy vetch can present. It is important to remember that with all legumes, a good rule of thumb is that have of the nitrogen produced will be available to the cash crop and the other half will be tied up in decomposition of the plant for release later in the season. Hairy vetch is a very dependable legume as far as establishment and performance. Its ease in establishment as well as winter survival make it a resourceful tool in any farmers mix. However, it is to be noted that it can present some challenges as well. With vines reaching up to twelve feet in length it can present challenging times to the farmer if the equipment is not properly set up to handle potential wrapping of the plant on the equipment. It also can have up to a 30% hard seed, meaning that there is a highly likely chance it will be present in the field for years to come even though it was not seeded. The hard seed is mother nature's way of ensuring survival of the species. Hairy Vetch does an excellent job in soil tilth in the top few inches in the soil, often creating the illusion of planting in a cloud due to the soil's looseness. Hairy Vetch is best grown with plants like cereal rye that enable the hairy vetch to climb up the cereal rye to allow air movement across the soil surface.
Seeds Per lb: 14,000
Legume: Cool Season
Minimum Germination Temp: 60 °F
Emergence Time: 14 days
Drill: 15 – 20 lbs. per acre
Broadcast With Light Incorporation:
17 – 22 lbs. per acre
Aerial Or Surface Seeding: 18 – 22 lbs. per acre

Medium Red Clover- Red clover is the number one choice of legumes when considering spring interseeding. Its ability to handle both shade and heat make it ideal for this. Red Clover is also utilized in any mixes where the cover crop will also be used for grazing or forage. With the potential to produce 100 + lbs. of nitrogen, it is a nice addition to mixes.
Seeds Per lb: 272,000
Legume: Cool Season
Minimum Germination Temp: 41 °F
Emergence Time: 7 days
Drill: 8 – 10 lbs. per acre
Broadcast With Light Incorporation:
9 – 11 lbs. per acre
Aerial Or Surface Seeding: 10 – 12 lbs. per acre

Sunflower- Sunflowers have an excellent and robust root system that enables them to capture nutrients that are available in the soil. Sunflowers are a must in any summer cocktail mix due to their rooting abilities and the positive influence they provide for beneficial insects. With their strong upright stalk they also provide support for vine plant to climb upright. Sunflowers also are good for Mycorizal Fungi growth.
Seeds Per lb: 7,000
Season: Warm Season
Minimum Germination Temp: 60°F
Emergence Time: 10-14 days
Drill: 5 – 10 lbs. per acre
Broadcast With Light Incorporation:
15 – 25 lbs. per acre
Not recommended.
Aerial Or Surface Seeding: 24 – 42 lbs. per acre
Not recommended for aerial seeding.

Sunn Hemp- Sunn Hemp is a tropical legume that is capable of producing 120 lbs. of Nitrogen. It can reach plant heights of 6- 7 feet tall. Sunn Hemp is an excellent crop for producing residue. It has a fibrous tap root and is a crop that can be grazed as well. Sunn Hemp has also shown to reduce the Soybean Cyst Nematode populations. Sunn Hemp must have at least 45 days of growth before the first frost date.
Seeds Per lb: 15,000
Legume: Warm Season
Minimum Germination Temp: 65 °F
Emergence Time: 3-7 days
Drill: 18-20 lbs. per acre
Broadcast With Light Incorporation:
25-35 lbs. per acre
Surface Seeding: 30-35 lbs. per acre
Not recommended for aerial seeding.

Daikon Radish- The radish is excellent at capturing nitrogen and other nutrients and pulling them into the tuber of the radish, so all nutrients are banned together. They also have a tap root that is capable of reducing compaction, however the radish does not like acidic subsoil's and have been known to turn when they reach an acidic subsoil. Some farm operators are precision planting their radishes in rows in order to ban the nutrients together, and then coming back in the spring and plant their corn right next to the row. Since the radish will winter kill they need to be planted at a minimum of 6 weeks prior to frost, but for better results 8-10 weeks if possible to achieve a better benefit. When the plant does die and begins to decay they will release an odor much like that of natural gas. Some varieties of the radish act as good soil bio fumigant. They are good at killing soil pathogens, pest and also suppressing weeds. They are best used when mixed with other cover crops in order to help prevent erosion and also for ground cover in the winter and early spring; due to the fact the radish will winter kill. Radish is one of the newer additions to the cover crop market. It is best known for its deep tap root, quick emergence and rapid growth. It is primarily used to break up soil compaction, capture residual Nitrogen, suppress weeds, increase water infiltration, and increase soil biology. Radish has been divided in 4 'types' of which 2 are being used as cover crops, they are: Daikon, Forage, and Sugarbeet cyst nematode resistant. The Daikon is the most popular, due to its large taproot. The Forage type has lush top growth but a smaller and more branching root. The fodder from all types of radishes provides good forage, similar to turnips. It's best to plan a single grazing period, since it does not tolerate traffic well. If seeded in late July to Mid August, root growth to a depth of 16+ inches is possible before a killing frost. Radish requires 8-10 weeks of 60 degree temperature to achieve optimum growth. The plant will die when temperatures reach 28 degrees F. After a killing frost the plant will decompose rapidly, leaving the ground bare by spring
Seeds Per lb: 34,000
Brassica: Cool Season
Minimum Germination Temp: 45 °F
Emergence Time: 3 – 5 days
Drill: 5 – 10 lbs. per acre
Broadcast With Light Incorporation:
5.5 – 11 lbs. per acre
Aerial Or Surface Seeding: 6 – 12 lbs. per acre

Dwarf Essex Rapeseed- Rapeseed is a plant that has a deep fibrous root system that is good for nutrient capture and also makes it a good subsoiler. Rapeseed has been shown to have biological activity against plant parasitic nematodes as well as weeds. Rapeseed is a very versatile crop when it comes to planting due to the fact it can be planted in the spring for a summer cover crop, and may also be planted in the fall for a winter cover crop. Rape is much more cold tolerant than radish's, in some cases they can last through the winter, making them a better choice if more cold tolerance is desired for the blend or for grazing. Rapeseed, is an excellent earthworm stimulator, when plants have been dug earthworms are right against the main roots. Rapeseed is also one of the most affordable ways to add diversity to any mix while still providing excellent benefits to the soil.
Seeds Per lb: 157,000
Brassica: Cool Season
Minimum Germination Temp: 41 °F
Emergence Time: 4 – 10 days
Drill: 2 – 5 lbs. per acre
Broadcast With Light Incorporation:
2.2 – 5.5 lbs. per acre
Aerial Or Surface Seeding: 2.4 – 6 lbs. per acre

Turnip- Turnips are an excellent cover crop when grazing will take place on the cover crop. They are good at capturing nitrogen and have the ability to suppress weeds. They are good for extending the grazing period on a field and work best when mixed with grass or cereal type cover crops for maximum benefit. Turnips are much more cold tolerant than radishes, therefore making them more ideal for grazing. Turnips are also a good source of sulfur. Earthworms love them!!
Brassica: Cool Season
Minimum Germination Temp: 45 °F
Emergence Time: 4 – 10 days
Drill: 1 – 3 lbs. per acre
Broadcast With Light Incorporation:
1.1 – 3.3 lbs. per acre
Aerial Or Surface Seeding: 1.2 – 3.6 lbs. per acre