

Cover crops key card

Key

WS: Warm-season

CS: Cool-season

G: Grass

L: Legume

B: Brassica

Vocabulary

N source: nitrogen producer

N scavenger: nitrogen scavenger; incorporates available soil nitrogen into its biomass

Soil builder: provides a healthy soil ecosystem for important soil organisms

Subsoiler: non-inversion tillage below the surface of the soil

Topsoil loosener: loosens the soil's topsoil

Erosion preventer: root system helps to keep soil in place

Lasting residue: the plant biomass remains and takes longer to decompose

Weed fighter: fights weeds by shading or chemical suppression

Grazing: creates growing plants for livestock that can be grazed upon and regenerate

Forage: creates forage (hay) that can be cut, cured, or fermented for livestock

Annual ryegrass (CS, G)



Objectives	0	1	2	3	4
N source					
N scavenger					
Soil builder					
Subsoiler					
Topsoil loosener					
Erosion preventer					
Lasting residue					
Weed fighter					
Grazing					
Forage					

Annual ryegrass (CS, G)

Annual ryegrass aids in erosion prevention, improves soil structure, adds organic matter, suppresses weeds, and scavenges nutrients.

Application method

Precision: 10 lb/A

Drilled: 12 lb/A

Broadcast: 15 lb/A

Aerial: 18 lb/A

Soils, seeding, and growth

Drainage: Poorly drained to well-drained soils

Fertility: Good tolerance of low fertility

pH Level: 6.0–7.0

Min. soil germ. temp: 40 °F

Avg. seeds/lb: 190,300

Inoculate: NR*

Height: 1.5–3 ft

Emergence: 14 days

Drought and heat: Low heat and drought tolerance

Flooding: Tolerates long flooding or ponding

Cereal rye (CS, G)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■	■	■
Soil builder	■	■	■	■	■
Subsoiler	■	■	■	■	
Topsoil loosener	■	■	■	■	■
Erosion preventer	■	■	■	■	■
Lasting residue	■	■	■	■	■
Weed fighter	■	■	■	■	■
Grazing	■	■	■	■	■
Forage	■	■	■		

Spring oats (CS, G)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■	■	
Soil builder	■	■	■	■	
Subsoiler	■				
Topsoil loosener	■	■	■	■	
Erosion preventer	■	■	■	■	■
Lasting residue	■	■	■		
Weed fighter	■	■	■	■	■
Grazing	■	■	■	■	■
Forage	■	■	■	■	

Spring oats (CS, G)

Spring oats are an upright, cool-season, annual grass. Oats grow quickly, scavenge nutrients, and die off in cold temperatures.

Application method

Precision: Not recommended

Drilled: 64 lb/A

Broadcast: 78 lb/A

Aerial: 94 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly drained to excessively drained soils

Fertility: Good tolerance of low fertility

pH Level: 4.5–6.5

Min. soil germ. temp: 38 °F

Avg. seeds/lb: 19,600

Inoculate: NR*

Height: 2–5 ft

Emergence: 5–8 days

Drought and heat: Low drought and heat tolerance

Flooding: Tolerates brief flood or ponding

Cereal rye (CS, G)

Cereal rye is an upright, cool-season, annual grass often confused with annual ryegrass. Rye can germinate under cooler conditions than other covers, offering a great option compared to other cover crops.

Application method

Precision: Not recommended

Drilled: 40–45 lb/A

Broadcast: 56–60 lb/A

Aerial: 65–70 lb/A

Soils, seeding, and growth

Drainage: Poorly drained to well-drained soils

Fertility: Excellent tolerance of low soil fertility

pH Level: 5.0–7.0

Min. soil germ. temp: 34 °F

Avg. seeds/lb: 18,200

Inoculate: NR*

Height: 3–6 ft

Emergence: 5–8 days

Drought and heat: Very good drought tolerance; low heat tolerance

Flooding: Tolerates brief flooding

Winter barley (CS, G)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■	■	
Soil builder	■	■	■	■	
Subsoiler	■	■	■		
Topsoil loosener	■	■	■	■	
Erosion preventer	■	■	■	■	■
Lasting residue	■	■	■	■	■
Weed fighter	■	■	■	■	
Grazing	■	■	■	■	
Forage	■	■	■	■	

Triticale (CS, G)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■	■	
Soil builder	■	■	■	■	
Subsoiler	■	■	■		
Topsoil loosener	■	■	■		
Erosion preventer	■	■	■	■	■
Lasting residue	■	■	■	■	■
Weed fighter	■	■	■	■	
Grazing	■	■	■	■	■
Forage	■	■	■		

Triticale (CS, G)

Triticale has rapid growth and can suppress weeds and provide additional erosion prevention.

Application method

Precision: 30 lb/A

Drilled: 50 lb/A

Broadcast: 60 lb/A

Aerial: 72 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly- drained to well-drained soils

Fertility: Very good tolerance of low fertility

pH Level: 5.2–7.2

Min. soil germ. temp: 38 °F

Avg. seeds/lb: 22,700

Inoculate: NR*

Height: 1.5–3 ft

Emergence: 6–8 days

Drought and heat: Good drought tolerance, low heat tolerance

Flooding: Tolerates brief flood or ponding

Winter barley (CS, G)

Barley can serve as a top soil protecting crop during drought conditions and reclaim overworked, weedy or eroded fields, or act as a cover crop mix for improving soil structure and nutrient cycling.

Application method

Precision: Not recommended

Drilled: 50 lb/A

Broadcast: 80 lb/A

Aerial: 96 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly drained to excessively drained soils

Fertility: Very good tolerance of low fertility

pH Level: 6.0–8.5

Min. soil germ. temp: 38 °F

Avg. seeds/lb: 13,600

Inoculate: NR*

Height: 1.5–3 ft

Emergence: 6–8 days

Drought and heat: Good drought tolerance; low heat tolerance

Flooding: Tolerates brief flood or ponding

Sorghum-sudangrass (WS, G)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■	■	■
Soil builder	■	■	■	■	■
Subsoiler	■	■	■		
Topsoil loosener	■	■	■		
Erosion preventer	■	■	■	■	■
Lasting residue	■	■	■	■	
Weed fighter	■	■	■	■	■
Grazing	■	■	■	■	
Forage	■	■	■	■	■

Japanese millet (WS, G)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■	■	■
Soil builder	■	■	■	■	
Subsoiler	■	■			
Topsoil loosener	■	■			
Erosion preventer	■	■	■	■	■
Lasting residue	■	■	■		
Weed fighter	■	■	■		
Grazing	■	■	■	■	
Forage	■	■	■	■	

Japanese millet (WS, G)

Japanese millet is an upright summer annual grass with extremely rapid growth.

Application method

Precision: Not recommended

Drilled: 13 lb/A

Broadcast: 15 lb/A

Aerial: 18 lb/A

Soils, seeding, and growth

Drainage: Poorly to moderately well-drained soils

Fertility: Very good tolerance of low fertility

pH Level: 4.6–7.4

Min. soil germ. temp: 65 °F

Avg. seeds/lb: 142,900

Inoculate: NR*

Height: 2–4 ft

Emergence: 3–5 days

Drought and heat: Excellent drought and heat tolerance

Flooding: Does not tolerate flooding or ponding

Sorghum-sudangrass (WS, G)

Sorghum-sudangrass is an upright, summer annual that increases organic matter, develops deep root systems, and suppresses weeds.

Application method

Precision: 16 lb/A

Drilled: 22 lb/A

Broadcast: 26 lb/A

Aerial: Not recommended

Soils, seeding, and growth

Drainage: Somewhat poorly drained to excessively drained soils

Fertility: Good tolerance of low fertility

pH Level: 6.0–7.0

Min. soil germ. temp: 65 °F

Avg. seeds/lb: 13–18,000

Inoculate: NR*

Height: up to 8 ft

Emergence: 10 days

Drought and heat: Excellent drought and heat tolerance

Flooding: Does not tolerate flooding or ponding

Pearl millet (WS, G)



Objectives	0	1	2	3	4
N source	0	1	2	3	4
N scavenger	0	1	2	3	4
Soil builder	0	1	2	3	4
Subsoiler	0	1	2	3	4
Topsoil loosener	0	1	2	3	4
Erosion preventer	0	1	2	3	4
Lasting residue	0	1	2	3	4
Weed fighter	0	1	2	3	4
Grazing	0	1	2	3	4
Forage	0	1	2	3	4

Berseem clover (WS, L)



Objectives	0	1	2	3	4
N source	0	1	2	3	4
N scavenger	0	1	2	3	4
Soil builder	0	1	2	3	4
Subsoiler	0	1	2	3	4
Topsoil loosener	0	1	2	3	4
Erosion preventer	0	1	2	3	4
Lasting residue	0	1	2	3	4
Weed fighter	0	1	2	3	4
Grazing	0	1	2	3	4
Forage	0	1	2	3	4

Berseem clover (WS, L)

Berseem clover is a summer or winter annual legume that will winterkill. It produces a lot of biomass that aids in weed suppression.

Application method

Precision: Not recommended

Drilled: 10 lb/A

Broadcast: 15 lb/A

Aerial: 18 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly drained to well-drained soils

Fertility: Fair tolerance of low fertility

pH Level: 4.9–7.8

Min. soil germ. temp: 42 °F

Avg. seeds/lb: 206,900

Inoculate: Crimson or berseem inoculate

Height: 16–20 inches

Emergence: 7 days

Drought and heat: Very good drought and heat tolerance

Flooding: Does not tolerate flooding or ponding

Pearl millet (WS, G)

Pearl millet is an upright summer annual bunch grass that uses low amounts of water and is wind pollinated.

Application method

Precision: Not recommended

Drilled: 4 lb/A

Broadcast: 5 lb/A

Aerial: 6 lb/A

Soils, seeding, and growth

Drainage: Poorly drained to well-drained soils

Fertility: Very good tolerance of low fertility

pH Level: 5.5–7.5

Min. soil germ. temp: 65 °F

Avg. seeds/lb: 82,300

Inoculate: NR*

Height: 2–4 ft

Emergence: 7 days

Drought and heat: Excellent drought and heat tolerance

Flooding: Does not tolerate flooding or ponding

Cowpea (WS, L)



Objectives	0	1	2	3	4
N source					
N scavenger					
Soil builder					
Subsoiler					
Topsoil loosener					
Erosion preventer					
Lasting residue					
Weed fighter					
Grazing					
Forage					

Crimson clover (CS, L)



Objectives	0	1	2	3	4
N source					
N scavenger					
Soil builder					
Subsoiler					
Topsoil loosener					
Erosion preventer					
Lasting residue					
Weed fighter					
Grazing					
Forage					

Crimson clover (CS, L)

Crimson clover is an upright to semi-upright winter annual that is adapted to cool, humid conditions.

Application method

Precision: not recommended

Drilled: 12 lb/A

Broadcast: 15 lb/A

Aerial: 18 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly to well-drained soils

Fertility: Very good tolerance of low fertility

pH Level: 5.5–7.0

Min. soil germ. temp: 42 °F

Avg. seeds/lb: 149,800

Inoculate: Crimson or berseem inoculant

Height: 12–20 inches

Emergence: 3–7 days

Drought and heat: Fair heat and drought tolerance

Flooding: Does not tolerate flooding or ponding

Cowpea (WS, L)

Cowpeas can produce up to 150 lbs/A of N and attract many beneficial insects to the area.

Application method

Precision: 35 lb/A

Drilled: 55 lb/A

Broadcast: 68 lb/A

Aerial: n/a

Soils, seeding, and growth

Drainage: Low flood tolerance

Fertility: Excellent tolerance of low fertility

pH Level: 5.5–6.5

Min. soil germ. temp: 60 °F

Avg. seeds/lb: 4,100

Inoculate: Peanut inoculate

Drought and heat: Excellent heat and very good drought tolerance once established

Flooding: Fair flooding tolerance

Hairy vetch (CS, L)



Objectives	0	1	2	3	4
N source					
N scavenger					
Soil builder					
Subsoiler					
Topsoil loosener					
Erosion preventer					
Lasting residue					
Weed fighter					
Grazing					
Forage					

Red clover (CS, L)



Objectives	0	1	2	3	4
N source					
N scavenger					
Soil builder					
Subsoiler					
Topsoil loosener					
Erosion preventer					
Lasting residue					
Weed fighter					
Grazing					
Forage					

Red clover (CS, L)

Red clover is a biennial perennial that can be frost seeded in late winter or early spring into small grains crops.

Application method

Precision: not recommended

Drilled: 8 lb/A

Broadcast: 10 lb/A

Aerial: 12 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly to excessively drained soils

Fertility: Low tolerance of low fertility

pH Level: 6.2–7.0

Min. soil germ. temp: 41 °F

Avg. seeds/lb: 272,200

Inoculate: red or white clover inoculant

Height: 12–36 inches

Emergence: 7 days

Drought and heat: Very good heat tolerance and good drought tolerance

Flooding: Tolerates some ponding and flooding once established

Hairy vetch (CS, L)

Hairy vetch is a winter hardy legume with a good taproot and high nodulation.

Application method

Precision: 7 lbs/A

Drilled: 15 lb/A

Broadcast: 20 lb/A

Aerial: 24 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly to well-drained soils

Fertility: Fair tolerance of low fertility

pH Level: 5.5–7.0

Min. soil germ. temp: 60 °F

Avg. seeds/lb: 16,300

Inoculate: Pea or vetch inoculant

Height: 3–7 feet

Emergence: 14 days

Drought and heat: Good drought tolerance; low heat tolerance

Flooding: Does not tolerate flooding or ponding

Sunn hemp (WS, L)



Objectives	0	1	2	3	4
N source					
N scavenger					
Soil builder					
Subsoiler					
Topsoil loosener					
Erosion preventer					
Lasting residue					
Weed fighter					
Grazing					
Forage					

Winter pea (CS, L)



Objectives	0	1	2	3	4
N source					
N scavenger					
Soil builder					
Subsoiler					
Topsoil loosener					
Erosion preventer					
Lasting residue					
Weed fighter					
Grazing					
Forage					

Winter pea (CS, L)

Winter pea is a low-growing vine-like annual legume. It is typically a fall seeded cover crop that can be used for grazing, hay, or green manure.

Application method

Precision: 26 lb/A

Drilled: 40 lb/A

Broadcast: Not recommended

Aerial: Not recommended

Soils, seeding, and growth

Drainage: Somewhat poorly drained to well-drained soils

Fertility: Very good tolerance of low fertility

pH Level: 6.0–7.0

Min. soil germ. temp: 41 °F

Avg. seeds/lb: 1,800–4,000

Inoculate: Pea or vetch inoculant

Height: 2–4 feet

Emergence: 9 days

Drought and heat: Low heat and drought tolerance

Flooding: Does not tolerate flooding or ponding

Sunn hemp (WS, L)

Sunn hemp is an upright legume that is adapted to tropical or subtropical areas, producing up to 4 tons of organic matter while suppressing many types of nematodes. It also has a large taproot structure and suppresses weeds.

Application method

Precision: 9 lb/A

Drilled: 12 lb/A

Broadcast: Not recommended

Aerial: Not recommended

Soils, seeding, and growth

Drainage: Well-drained soils

Fertility: Good tolerance of low fertility

pH Level: 5.5–7.0

Min. soil germ. temp: 68 °F

Avg. seeds/lb: 15,000

Inoculate: Cowpea or peanut inoculant

Height: 4–6 feet

Emergence: 3 days

Drought and heat: High heat and drought tolerance

Flooding: Does not tolerate flooding

Buckwheat (WS, B)



Objectives	0	1	2	3	4
N source	1				
N scavenger	1	1			
Soil builder	1	1	1		
Subsoiler	1				
Topsoil loosener	1	1	1	1	
Erosion preventer	1	1			
Lasting residue	1				
Weed fighter	1	1	1	1	1
Grazing	1				
Forage	1				

Daikon radish (CS, B)



Objectives	0	1	2	3	4
N source	1				
N scavenger	1	1	1	1	1
Soil builder	1	1	1	1	
Subsoiler	1				1
Topsoil loosener	1	1	1	1	
Erosion preventer	1	1			
Lasting residue	1	1			
Weed fighter	1	1	1	1	
Grazing	1	1	1	1	
Forage	1	1	1	1	

Daikon radish (CS, B)

Daikon radish is a cool-season, upright broadleaf that can break up compaction and scavenge nutrients. It is easily managed in colder regions due to winterkilling.

Application method

Precision: 4 lb/A

Drilled: 6 lb/A

Broadcast: 8 lb/A

Aerial: 10 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly to well-drained soils

Fertility: Low tolerance of low fertility

pH Level: 6.0–7.5

Min. soil germ. temp: 45 °F

Avg. seeds/lb: 25,000

Inoculate: no

Height: 12–18 inches

Emergence: 3–5 days

Drought and heat: Good heat and drought tolerance

Flooding: Does not tolerate flooding or ponding

Buckwheat (WS, B)

Buckwheat is a short-season crop that excels in weed suppression while attracting beneficial insects. It is a good cover crop for rejuvenating over farmed soils.

Application method

Precision: Not recommended

Drilled: 20 lb/A

Broadcast: 22 lb/A

Aerial: 27 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly to excessively drained soils

Fertility: Good tolerance of low fertility

pH Level: 5.0–7.0

Min. soil germ. temp: 50 °F

Avg. seeds/lb: 20,400

Inoculate: no

Height: 2–5 feet

Emergence: 3–7 days

Drought and heat: Excellent heat tolerance; low drought tolerance

Flooding: Does not tolerate flooding or ponding

Kale (CS, B)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■	■	
Soil builder	■	■	■		
Subsoiler	■	■	■	■	
Topsoil loosener	■	■			
Erosion preventer	■	■	■		
Lasting residue	■	■			
Weed fighter	■	■	■		
Grazing	■	■	■	■	
Forage	■	■	■	■	

Mustard (CS, B)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■		
Soil builder	■	■	■	■	
Subsoiler	■	■			
Topsoil loosener	■	■	■	■	
Erosion preventer	■	■	■	■	
Lasting residue	■	■			
Weed fighter	■	■	■	■	
Grazing	■	■	■		
Forage	■	■	■		

Mustard (CS, B)

Mustard has high levels of potent glucosinolates (GSLs) which when triggered can release compounds called isothiocyanates (ITCs) which suppress diseases and target nematodes.

Precision: Not recommended

Drilled: 10 lb/A

Broadcast: 12 lb/A

Aerial: 15 lb/A

Soils, seeding, and growth

Drainage: Excels in well-drained soils

Fertility: Very sensitive to insufficient nitrogen

pH Level: 5.5–7.5

Min. soil germ. temp: 43 °F

Avg. seeds/lb: 180,000

Inoculate: no

Height: 25 inches

Emergence: 5–7 days

Drought and heat: Good heat and drought tolerance

Flooding: Low flooding tolerance

Kale (CS, B)

Kale is an upright, cool-season annual broadleaf that is a great weed suppressor.

Application method

Precision: 4 lb/A

Drilled: 6 lb/A

Broadcast: 8 lb/A

Aerial: 10 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly to well-drained soils

Fertility: Fair tolerance of low fertility

pH Level: 6.6–7.8

Min. soil germ. temp: 38 °F

Avg. seeds/lb: 175,000

Inoculate: no

Height: 25 inches

Emergence: 14 days

Drought and heat: Good heat and cold tolerance;
good drought tolerance

Flooding: Fair flooding tolerance

Peredovik sunflower (WS, B)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■				
Soil builder	■	■	■	■	
Subsoiler	■	■	■	■	■
Topsoil loosener	■				
Erosion preventer	■	■	■	■	■
Lasting residue	■	■	■	■	
Weed fighter	■	■	■		
Grazing	■				
Forage	■				

Phacelia (CS, B)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■				
Soil builder	■	■	■	■	■
Subsoiler	■	■	■	■	■
Topsoil loosener	■	■	■	■	
Erosion preventer	■	■	■	■	
Lasting residue	■	■			
Weed fighter	■	■	■	■	
Grazing	■	■	■		
Forage	■	■	■		

Phacelia (CS, B)

Phacelia has an extensive, fibrous root system that can reach up to 30 inches. It attracts many beneficial insects and is a good weed suppressor.

Application method

Precision: Not recommended

Drilled: 7 lb/A

Broadcast: 9 lb/A

Aerial: 11 lb/A

Soils, seeding, and growth

pH Level: 6.6–7.8

Min. soil germ. temp: 4370F

Avg. seeds/lb: 235,000

Inoculate: no

Height: 6–47 inches

Emergence: 3–11 days

Peredovik sunflower (WS, B)

Perodovik sunflower is a fast-growing summer annual with an extensive root system that attracts many birds and pollinators.

Application method

Precision: 5 lb/A

Drilled: 9 lb/A

Broadcast: 1 lb/A

Aerial: n/a

Soils, seeding, and growth

Fertility: Good low fertility tolerance

pH Level: 6.0–7.5

Min. soil germ. temp: 65 °F

Avg. seeds/lb: 7,500

Inoculate: no

Height: 10–12 feet

Emergence: 5–7 days

Drought and heat: Excellent heat and drought tolerance

Flooding: Good flooding tolerance

Purple top turnip (CS, B)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■	■	
Soil builder	■	■			
Subsoiler	■				
Topsoil loosener	■	■	■	■	
Erosion preventer	■	■			
Lasting residue	■	■			
Weed fighter	■	■	■	■	
Grazing	■	■	■	■	■
Forage	■				

Rapeseed (CS, B)



Objectives	0	1	2	3	4
N source	■				
N scavenger	■	■	■	■	
Soil builder	■	■	■		
Subsoiler	■		■		
Topsoil loosener	■	■	■	■	
Erosion preventer	■	■			
Lasting residue	■	■	■		
Weed fighter	■	■	■		
Grazing	■	■	■	■	
Forage	■	■			

Rapeseed (CS, B)

Rapeseed is an upright, winter annual broadleaf with a deep fibrous root system. It is a good scavenger of nitrogen and phosphorus.

Application method

Precision: not recommended

Drilled: 3 lb/A

Broadcast: 4 lb/A

Aerial: 5 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly to well-drained soils

Fertility: Good tolerance of low fertility

pH Level: 5.5–8.0

Min. soil germ. temp: 41 °F

Avg. seeds/lb: 157,000

Inoculate: no

Height: 3–5 feet

Emergence: 4–10 days

Drought and heat: Good drought tolerance; low heat tolerance

Flooding: Does not tolerate flooding or ponding

Purple top turnip (CS, B)

Purple top turnips reduce soil compaction, improve water filtration, and scavenge nutrients. They also act as a grazing source.

Application method

Precision: 2 lb/A

Drilled: 3 lb/A

Broadcast: 4 lb/A

Aerial: 5 lb/A

Soils, seeding, and growth

Drainage: Somewhat poorly to well-drained soils

Fertility: Low tolerance of low soil fertility

pH Level: 5.3–6.8

Min. soil germ. temp: 45 °F

Avg. seeds/lb: 192,800

Inoculate: no

Height: 6–12 inches

Emergence: 4–10 days

Drought and heat: Good heat tolerance; low drought tolerance

Flooding: Does not tolerate flooding or ponding