

LivingFields



PLANTING POTENTIAL

Your quick guide to cover crop selection





Beyond the harvest

Shielding your fields all year round

Cover crops can be a great ally by providing ground cover for your fields during the off-season. Protecting against erosion, reducing water runoff, and enriching the soil are just a few of their advantages. But the benefits don't end there. Cover crops can help maintain biodiversity in the fields both above and below ground. They attract insects and foster soil microbial communities.

Collectively, these assets can translate into improved crop yields and reduced reliance on chemical inputs, offering both environmental and economic advantages. But to maximise their impact, choosing the appropriate crop is key.

Cultivating resilience

Aligning plant traits with agricultural objectives

When selecting a cover crop, it is essential to ensure it tailors to the needs of each cropping system.



Root depth: influences whether the crop can break up compaction or capture surface nutrients.



Plant height: determines how well the crop can provide ground cover and suppress weeds.



Frost hardiness: critical for matching species to local climate conditions.



Leguminous nature: key for nitrogen fixation.



Root type: affects soil structure improvements like topsoil stabilisation or breakthrough of compacted soil layers.



Biodiversity advantages: Each species can have a specific impact on the ecosystem's biodiversity.



Rooted in success

Exploring top species for strategic planting

Whether you aim to enhance soil fertility or suppress persistent weeds, this guide is designed to assist you in selecting the most suitable cover crop.

By exploring the characteristics and benefits of over 20 cover crop species, you'll be equipped to make informed decisions that align with your agricultural goals and environmental conditions.

OIL RADISH

Raphanus sativus var. oleiformis

Oil radish is a brassica cover crop distinguished by its long, robust taproot that penetrates compacted soil layers. It establishes quickly in early autumn, forming a dense stand that provides immediate soil cover. The root decomposes in the spring and leaves large, deep holes in the soil. This enables water, air, and cash crops to penetrate the soil in the summer, when it is dry and hard.

Moreover, the roots of oilseed radish absorb nitrogen at greater depths than other crops, keeping it from leaching into the groundwater. They also exude chemicals that help suppress soil pests like nematodes!



				
Deep	Short	No	Sensitive	Tap



If not properly managed, this plant can become invasive! To prevent oilseed radish from becoming a weed pest, kill the crop before the plants produce seeds.

EcoFact

Planting oilseed radish can be an alternative to using machinery to plough the soil!



TILLAGE RADISH

Raphanus sativus var. longipinnatus

Tillage radish, also called daikon radish, is well known for its deep taproot that can extend several feet into the soil. Similarly to oil radish, it is sown in autumn and is well known for its capacity to break up compacted soil layers. Its deep root improves water infiltration in the soil, nutrient recycling and can help suppress pests.



Deep	Short	No	Sensitive	Tap



In milder winter climates, tillage radish may persist longer than desired and compete with early cash crops.

MUSTARD

Sinapis alba or Brassica juncea

Mustard is a fast-growing brassica cover crop that is shown in early autumn. It grows quickly, providing rapid ground cover, reducing erosion and suppressing weeds.

Moreover, its glucosinolates act as a natural biofumigant, helping to control soilborne pests and pathogens.



Shallow	Tall	No	Sensitive	Tap



When decomposing, mustard produces allelopathic compounds that can inhibit the germination of sensitive cash crops. To avoid this, kill the plant before flowering.

EcoFact

Mustard can help reduce reliance on chemical inputs, lowering overall production costs.

PHACELIA

Phacelia tanacetifolia

Phacelia is a broadleaf cover crop known for its rapid growth and nectar-rich flowers. It quickly forms a dense, protective mat over the soil, providing ground cover and effective weed suppression.

The abundant flowers boost local biodiversity by attracting pollinators and beneficial predators, supporting a healthy ecosystem.



				
Shallow	Tall	No	Tolerant	Tap



Phacelia is sensitive to high temperatures. If the growing season becomes too warm, it may bolt prematurely, reducing its effective cover period.

SWEET CLOVER

Melilotus officinalis

Sweet clover is a leguminous cover crop often used to enrich soil and improve moisture retention. It produces significant biomass, providing extensive ground cover and contributing to enhanced organic matter and improved soil structure. Moreover, by fixating atmospheric nitrogen, it reduces the need for synthetic fertiliser.



				
Deep	Tall	Yes	Sensitive	Tap



The persistent growth of sweet clover can lead to competition with cash crops. In grazing fields, improper management can also raise the risk of livestock bloating.

EcoFact

Sweet clover is particularly valuable in rotations aimed at long-term soil improvement.

EGYPTIAN CLOVER

Trifolium alexandrinum

Egyptian clover is a fast-growing legume well adapted to warm climates. It establishes quickly, fixes nitrogen efficiently, and produces ample biomass, making it suitable for both cover cropping and forage production. It enhances soil fertility and reduces the need for chemical fertilisers.



				
Shallow	Tall	Yes	Sensitive	Tap



Due to its warm-climate adaptation, Egyptian clover can persist into early spring, potentially competing with cash crops.

HAIRY VETCH

Vicia villosa

Hairy vetch is a popular winter annual legume valued for its robust nitrogen-fixing ability and high biomass production. Because of its dense growth, it provides rapid and extensive ground cover, improves soil moisture and suppresses weed growth.

The high biomass production of Hairy vetch also contributes to improved soil organic matter over time.



				
Shallow	Short	Yes	Sensitive	Tap



Hairy vetch produces hard seeds that can lay ungerminated for several seasons and cause weed problems in winter grains.

EcoFact

Hairy vetch can also be grown for pasture!



BIRD'S-FOOT TREFOIL

Lotus corniculatus

Bird's-foot trefoil is a perennial legume known for its low-growing, spreading habit.

It establishes slowly but offers steady ground cover and forage benefits. As with all leguminous plants, it improves soil fertility through nitrogen fixation. However, it generates lower biomass compared to fast-growing annual legumes.



Shallow	Short	Yes	Sensitive	Tap



Because of its slow establishment, bird's-foot trefoil is not ideal for short-term cover needs. For optimal soil protection, it might need to be combined with faster-growing species.

LUCERNE

Medicago sativa

Lucerne, commonly known as alfalfa, is a deep-rooted perennial legume that is highly valued for its ability to fix substantial amounts of nitrogen. It is widely used both as a cover crop and as a forage species, contributing robust biomass to the soil.

Lucerne's deep roots break up compacted soil, improve water uptake, and significantly enhance soil fertility.



Deep	Short	Yes	Sensitive	Tap



Lucerne can be slightly more expensive than other cover crop species.

PERSIAN CLOVER

Trifolium resupinatum

Persian clover is a fast-growing annual legume that quickly establishes in warm conditions. It fixes nitrogen effectively and produces moderate biomass, making it a useful cover crop for short-term rotations.

Its quick establishment also reduces erosion and provides a favourable habitat for soil microbes.



				
Shallow	Short	Yes	Sensitive	Tap



Persian clover is a fast-growing crop and can become invasive if not properly managed!

BUCKWHEAT

Fagopyrum esculentum

Buckwheat is a fast-growing broadleaf cover crop that quickly develops a dense canopy, providing immediate soil cover and weed protection. Its attractive flowers also add an aesthetic value and support pollinator populations.



				
Shallow	Tall	No	Sensitive	Tap



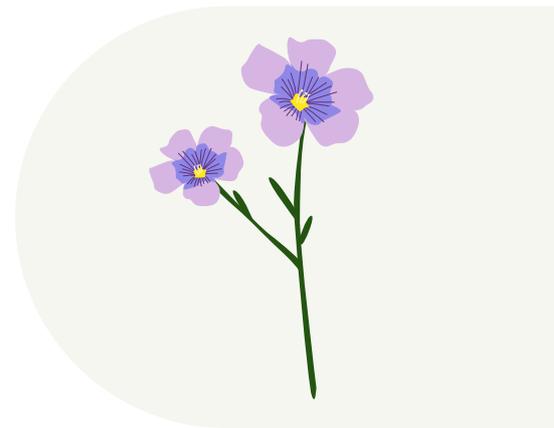
Buckwheat is cold-sensitive, and its growing season is limited to warm weather. Planting requires careful timing!

LINSEED

Linum usitatissimum

Also known as flax, Linseed is a low-input need cover crop. It forms a fibrous root system that, while not as deep as some other species, still enhances soil tilth and moisture retention.

Linseed can also be used to increase diversity in crop rotations with wheat and other small grains. Moreover, since it is cold-resistant, it can be planted in strips in grain fields to catch snow and protect the seeded crops.



				
Shallow	Short	No	Tolerant	Tap



Linseed's shallow roots are less effective at breaking up compacted soils than deep-rooted cover crops

EcoFact

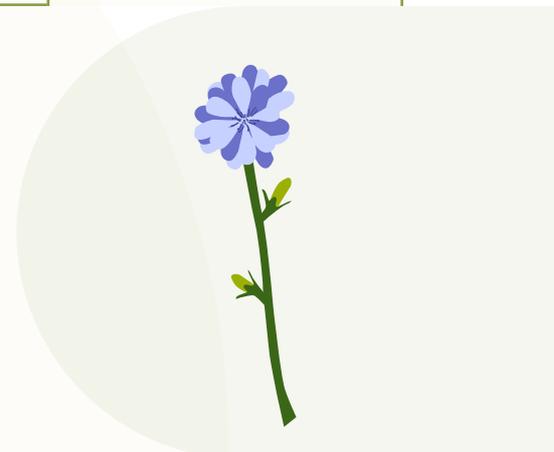
Hairy vetch can also be grown for pasture!

CHICORY

Cichorium intybus

Chicory is a perennial cover crop known for its deep taproot, which enhances soil drainage and nutrient scavenging. Its deep taproot breaks up compacted soil layers and brings nutrients from deeper horizons to the surface. Moreover, its drought tolerance improves soil drainage and makes it a versatile choice for a variety of soil conditions.

Chicory produces attractive flowers that can attract beneficial insects and pollinators, contributing to a balanced agroecosystem.



				
Deep	Tall	No	Tolerant	Tap



In warm conditions, chicory may bolt prematurely, reducing its effective period as a cover crop.



RIBWORT PLANTAIN

Plantago lanceolata

Ribwort plantain is occasionally used as a cover crop because of its broad leaves and fibrous root system, which help provide modest weed suppression. It is adaptable to a wide range of soil conditions and requires minimal management. It can also help reduce erosion and support soil microbial diversity without significant input costs.



				
Deep	Short	No	Tolerant	Tap



Ribwort plantain produces less biomass than many dedicated cover crops, and if not mowed or managed properly, it may become too competitive with the following cash crop.

COMMON VETCH

Vicia sativa

Common vetch is an annual legume renowned for its strong nitrogen-fixing ability and substantial biomass production. It is commonly incorporated into cover crops mixed with cereals to boost soil fertility and organic matter content.

Its dense growth also provides good erosion control, supporting a robust soil ecosystem.



				
Shallow	Short	Yes	Tolerant	Tap



If not terminated at the proper time, common vetch can persist in the next season, potentially competing with early cash crops.

WHITE CLOVER

Trifolium repens

White clover is a perennial legume that forms a dense, low-growing mat over the soil, providing continuous cover and steady nitrogen fixation. It is widely used in both cover cropping and forage systems due to its reliability and ease of establishment.

Its low-growing habit means it typically does not compete aggressively with cash crops when managed properly.



				
Shallow	Short	Yes	Tolerant	Tap

EcoFact

Many wildlife and bird species forage on white clover. Honeybees and other insects cross-pollinate the flowers as they collect nectar and pollen.

RED CLOVER

Trifolium pratense

Red clover is a biennial or short-lived perennial legume that gradually builds a high biomass and fixes significant nitrogen over time. It is most beneficial in longer rotations where gradual soil improvement is desired. However, it establishes slowly and is less suited for short-term cover needs.



				
Deep	Short	Yes	Tolerant	Tap



The cost of red clover seeds can be higher than other cover crops.

CRIMSON CLOVER

Trifolium incarnatum

Crimson clover is an annual legume distinguished by its rapid growth and vibrant red blooms. It quickly establishes a dense cover that provides both nitrogen fixation and effective weed suppression, making it ideal for short-term rotations.

Crimson clover produces vibrant blooms that support pollinator and insect populations, enhancing field biodiversity.



Shallow



Short



Yes



Tolerant



Tap



The fast growth and short life cycle of crimson clovers can be challenging to manage.

WHITE MILLET

Panicum miliaceum

White millet is a small-seeded cereal known for its excellent drought tolerance and rapid establishment in hot, dry conditions. It quickly forms a protective ground cover that is particularly valuable during summer rotations. During periods of high heat, it can be key in reducing erosion and conserving soil moisture.



Shallow



Tall



No



Sensitive



Fibrous



White millet produces less biomass than other cover crops which limits its effectiveness. Combine it with other species for optimal results.

RED MILLET

Panicum miliaceum

Red millet is a locally adapted variety of millet that shares many characteristics with White Millet, thriving in hot, arid conditions and establishing rapidly to cover the soil. It is valued for its quick growth in regions where drought stress is a primary concern. It provides prompt soil cover and helps reduce erosion by rapidly establishing a protective canopy.



				
Shallow	Tall	No	Sensitive	Fibrous

 The performance of red millet is variable depending on local conditions.

BLACK OATS

Avena strigosa

Black oats are a winter-resistant cereal cover crop known for producing high biomass and developing an extensive root system. They form a dense stand in the fall and early winter, providing excellent soil protection and nutrient scavenging. Black oats also contribute to weed suppression naturally.



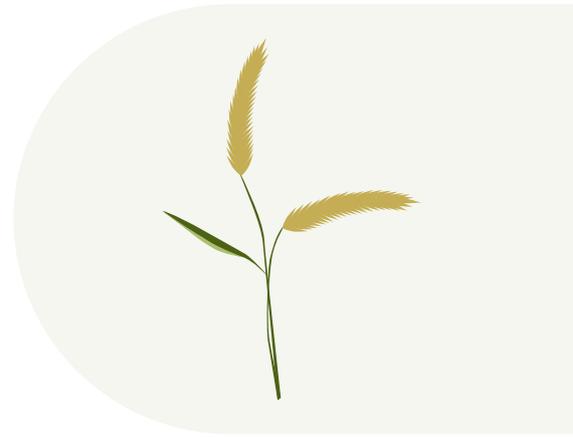
				
Deep	Tall	No	Sensitive	Fibrous

 If allowed to mature and set seed, black oats can become invasive

RYE

Secale cereale

Rye is one of the most commonly used cover crops, valued for its vigorous growth and high biomass production. It thrives in cool, wet conditions and is typically sown in the fall to provide robust winter cover. Its ability to scavenge residual nutrients and produce significant biomass makes rye excellent for erosion control and weed suppression.



				
Shallow	Tall	No	Tolerant	Fibrous



Rye can produce allelopathic compounds that inhibit the germination of sensitive cash crops. To avoid these negative effects, terminate it 2-3 weeks before planting the next crop.

OATS

Avena sativa

Oats are a fast-growing cereal cover crop that establishes rapidly and are particularly valued for their natural tendency to winterkill in colder climates. They create a light, effective ground cover during the fall. The rapid establishment of oats provides immediate soil protection and effective weed suppression.



				
Shallow	Tall	No	Tolerant	Fibrous



In areas with milder winters, oats may persist longer than intended, potentially interfering with the early growth of cash crops.

WESTERWOLDS RYEGRASS

Lolium perenne

Westerwolds ryegrass is a cover crop noted for its rapid growth and ability to form a dense mat over the soil surface. It is commonly used in mixtures to enhance erosion control and improve soil structure through its extensive fibrous root system.

Its fast and dense growth effectively suppresses weeds and provides immediate soil cover. The extensive root system improves water infiltration and soil tilth, contributing to overall field health and productivity.



				
Shallow	Tall	No	Tolerant	Fibrous



If seeded too densely or left unmanaged, westerwolds ryegrass can become overly competitive with later cash crops

Summary table

Species	Root Depth		Plant Height		Leguminous		Frost Hardiness		Root Type	
	Deep (>40cm)	Shallow (<40cm)	Tall (>60cm)	Short (<60cm)	Legume	Non-legume	Tolerant	Sensitive	Tap	Fibrous
Fodder/Oil radish	•			•		•		•	•	
Tillage radish	•			•		•		•	•	
Mustard		•	•			•		•	•	
Phacelia		•	•			•	• ¹	• ¹	•	
Sweet Clover	•		•		•			• ²	•	
Egyptian clover		•	•		•			•	•	
Hairy vetch		•		•	•			•	•	
Bird's-foot trefoil (Ag)		•		•	•			• ²	•	
Lucerne	•			•	•			• ²	•	
Persian clover		•		•	•			•	•	
Buckwheat		•	•			•		•	•	
Linseed		•		•		•	•		•	
Chicory	•		•			•	•		•	
Ribwort plantain	•			•		•	•		•	
Common vetch		•		•	•		•		•	
White clover		•		•	•		•		•	
Red clover (Ag)	•			•	•		•		•	
Crimson clover		•		•	•		•		•	
White millet		•	•			•		•		•
Red millet		•	•			•		•		•
Black oats	•		•			•		•		•
Rye		•	•			•	•			•
Oats		•	•			•	•			•
Westerwolds ryegrass		•	•			•	•			•

1 Young plants are frost sensitive and older plants can die back after successive

2 Dies back in winter and regrows in spring

