Foreword
Soil fertility and structure are under severe pressure through use of heavy machinery, intensive rotations and declining organic matter content. Compounded by increased weed, disease and pest problems, cover cropping has become an essential cultural means to begin the journey to remedying this. Recent reforms to the Common Agricultural Policy also mean that cover crops can be used to meet ‘Greening’ requirements.
Cover cropping is not a new concept and is already used extensively in France, Germany and elsewhere in Europe, but it is important that the choice of species or mixture is tailored to your own farm and with specific aims in mind.
The varieties in the Openfield range are either produced here in the UK or carefully selected from some of the leading European breeders, ensuring that we only supply products that are fit for purpose. Our mixtures are formulated on the back of three years of trials, which we invite farmers and merchants to attend to make their own observations alongside ours.
This brochure aims to inform you about the potential benefits of cover crops and how you can best work towards achieving your aims - from selecting the right varieties to creating the right mixture. Coupled with the relevant technical information, we hope this guide will enable you to make well-informed decisions, tailored to your own farm situation.

Legislation
An overhaul to the Common Agricultural Policy (CAP) in 2014 and 2015 means that the Basic Payment Scheme now consists of Cross Compliance and ‘Greening’ – which is worth 30% of the total payment. The three pillars of ‘Greening’ are Permanent Grassland, Crop Diversification and Ecological Focus Areas (EFAs). Catch and cover crops are proving popular as farmers look to take advantage of the incentive to experiment with cover crops and improve soil quality for the long term.
Seed Regulations
- Greening mixtures may contain species currently covered by seed regulations and those that are not regulated (these include black oats, rape, etc).
- Regulated species must be fully certified to the standards in the Seed Marketing Regulations – having achieved purity and germination standards.
- Mixtures containing any certified species should have percentages of these species declared on a green label, and any uncertified species should be listed.
- Cover crops are subject to the same farm-saved seed rules as cash crops – although cover crops are not taken to harvest, the farm-saved & seed payment is due at the time of sowing.
- Farm-saved seed must have been originally produced from certified seed on the farmer’s own holding.
- It is illegal to use uncertified grain brought in from another farm.

EFAs – What Counts?
- Feature/Area | What it’s worth?
- Hedges | 1m=5sqm
- Buffer Strips | 1m=9sqm
- Fallow | 1sqm=1sqm
- Catch/Cover Crops | 1sqm=0.3sqm
- Nitrogen Fixing Crops | 1sqm=0.7sqm

Ecological Focus Areas (EFAs)
- Ecological Focus Areas are areas or features that the EU has decided are beneficial for the climate and/or environment.
- If a farmer has more than 15 hectares of arable land, they will need EFAs.
- If a farm does need EFAs, the areas and features must be equivalent to at least 5% of the total arable area declared on their BPS application.

EFAs – What Counts?
- Any information provided in this catalogue is given in good faith. We cannot accept any legal liability for information given in this guide.

EFA Compliant Species
- Rye
- Barley
- Vetch
- Mustard
- Phacelia
- Oats
- Lucerne
- Oil Radish

Mixtures must be sown, and in the ground for either:
- 31st August – 1st October – Catch Crop
- 1st October – 15th January – Cover Crop

For the latest information regarding EFAs, see www.gov.uk/cap-reform.
Cover crops can be used for a wide variety of purposes, so having a clear idea of what specific aims you want to achieve is paramount in getting the required results. A well composed mixture can have numerous benefits to the soil when integrated carefully in to the crop rotation.

**Soil Structure**

Cover crops benefit physical soil structure, breaking up compaction and encouraging water uptake. Species such as oil radish produce deep, penetrative roots, but there are many other species that can also be soil-effective. Lateral root growth from species such as mustard and fibrous root networks from species such as black oats and linseed all effectively relieve compaction in different layers of the soil. This root structure combined with the leaf canopy also prevent soil erosion.

**Biofumigation**

Biofumigation is the process of using plant chemicals to suppress soil-borne pathogens, nematodes, insects and weeds. When a suitable variety of brown mustard (see Vittasso and Scala) is chopped and incorporated in to moist soil, chemical reactions produce Isothiocyanate (ICT), a natural biofumigant with similar insecticidal effects to Methyl Bromide or Metham Sodium. Scala, and particularly Vittasso, contain very high levels of Glucosinolates in the cell vacuoles. When the crop is finely chopped, the vacuoles burst allowing the enzyme Myrosinase to react with the Glucosinolates to produce the biofumigant Isothiocyanate (ICT). For best effect, the crop should be finely chopped at the point of flowering to maximise the Glucosinolate content and then incorporated in to moist soil conditions. Water is essential for the chemical reaction to take place.

**Nematode Control**

Specific varieties of oil radish control certain plant-parasitic nematodes by up to 90%. The roots secrete pheromones which lure the larvae from their cryptobiotic state in the cysts. Then once in the roots, the larvae are subsequently unable to develop to maturity and die.

Type 1 nematode resistant varieties have the ability to reduce nematode populations by up to 90%.

Type 2 nematode resistant varieties have the ability to reduce nematode populations by up to 85%.

For maximum nematode control, sowing rates should be increased to 25kg/ha to produce high biomass and close root proximity. When crop is 75% in bloom it should be mown to a height of 25-30cm for the plant to regrow. 50kg/ha of nitrogen is required in heavy soils.

**Allelopathy**

Allelopathy describes the chemical inhibition of one plant by another, due to the release of substances acting as germination or growth inhibitors. Black oats have a powerful allelopathic effect on broad leaved weeds, making them the ideal choice for weed suppression. It is essential to wait a minimum of two weeks after the destruction of a black oats crop before sowing a cash crop to minimise any negative effects from the allelopathic chemicals excreted during decomposition.

**Weed Control**

Cover crop species control weeds through light and nutrient deprivation. Faster growing brassica species and phacelia are most effective.

**Organic Matter**

Up to 3% of the soil’s organic matter is used by crops each year, which has led to some soils on arable farms becoming severely deficient. Incorporating fresh organic matter improves soil structure, mineral composition and beneficial microbial activity. It also aids soil aeration and locks in mineral nitrogen making it available to following crops.

**Nitrogen**

Addition of nitrogen can be made available for cash crops by fixing nitrogen from the atmosphere or preventing nitrogen leaching from the soil.

**FIXATION**

Legumes fix nitrogen from the atmosphere making it available to the following crops. Quick growing species such as crimson clover and berseem clover are best for short breaks between cash crops, whereas vetches can move more effective for a longer growing period. It is important to note that legumes become most effective at fixing nitrogen when the soil temperature is over 8°C.

**LEACHING PREVENTION**

Nitrogen and other nutrients are lost through leaching when soil is left bare for any period of time, particularly over the winter when rainfall is high. Scavenging this nitrogen from the soil and holding it for the following crops is often easier and more effective than attempting to fix additional nitrogen from the atmosphere. It can be done effectively with cereals and mustard.
**Black Oat**

Variety: **DELUX**

DELUX is the newest variety of black oats from leading European breeder Panam, developed specifically for the cover crop market. DELUX combines late maturity, rapid establishment and high biomass production.

- More frost sensitive than other cereals
- Allelopathic variety
- Controls root lesion nematode (Pratylenchus penetrans)
- Resistant to root-knot nematode (Meloidogyne hapla)
- Develops fibrous roots to relieve soil compaction
- Resistant to rust, barley yellow dwarf virus and aphids

**Vething Period:** Aug-Oct  
**Sowing Depth:** 1-2cm  
**Sowing Rate:** 30-50kg/ha  
**Winter Hardy:** No

---

**Forage Rye**

Variety: **TURBOGREEN**

TURBOGREEN is the perfect rye variety for cover crops – suitable for very late sowings, quick to establish and late maturing. Forage rye scavenge nitrogen from the soil making it accessible to the following crop.

- Late maturity and good lodging resistance
- Resistant to rust and mildew
- Rapid tillering and root development
- High dry matter yield
- Resistant to rust and aphids

**Sowing Period:** Aug-Oct  
**Sowing Depth:** 1-2cm  
**Sowing Rate:** 30-50kg/ha  
**Winter Hardy:** Yes

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**Vetch**

Variety: **SLOVENA**

SLOVENA is more tolerant to frost than most common vetch varieties making it the number one choice to go through the winter. Most effective at fixing nitrogen when allowed a prolonged growing season in either spring or autumn.

- Large seed size ensures strong early vigour
- Resistant to rust and mildew
- Rapid establishment
- Excellent companion to both black oats and rye
- Organic seed also available

**Sowing Period:** Mar-Oct  
**Sowing Depth:** 1-2cm  
**Sowing Rate:** 50kg/ha  
**Winter Hardy:** Variety dependent

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**White Mustard (type 2)**

Variety: **SUNSHINE**

SUNSHINE is UK produced and much more than just ‘white mustard’ – high vigour, late flowering and powerful nematode resistance. Bred in Scandinavia, SUNSHINE is more frost tolerant than most other white mustard varieties.

- High vigour and late maturing
- Produces high dry matter
- Rapid autumn growth
- Exceptional root development
- Type 2 beet cyst nematode (Heterodera schachtii) resistant – Pf/Pi 0.200
- Organic seed also available

**Sowing Period:** Apr-Sept  
**Sowing Depth:** 0.5cm  
**Sowing Rate:** 10-15kg/ha  
**Winter Hardy:** No

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**Brown Mustard**

Variety: **SCALA**

SCALA is the choice brown mustard variety for a winter hardy cover crop to suppress weeds, pump water and improve soil structure. Using SCALA provides maximum benefit to the soil at an economical price per hectare.

- Developed by leading breeder Vandinter Semo
- Strong early vigour, medium maturity
- Rapid autumn growth and winter hardy
- Exceptional root development in a short period of time
- Active against Pythium, Rhizoctonia and Verticillium
- Exceptional root development
- Excellent companion to both black oats and rye

**Sowing Period:** Apr-Sept  
**Sowing Depth:** 1-2cm  
**Sowing Rate:** 5kg/ha  
**Winter Hardy:** Yes

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**Brown Mustard**

Variety: **VITASSO**

VITASSO combines the benefits of brown mustard as a cover crop with powerful biofumigation capability. Produced by KWS to control wireworm, PCN, Pythium, Rhizoctonia, Verticillium, Silver Scurf and Sclerotinia.

- Improves soil health and captures nitrogen
- Increases organic matter and suppresses volunteers
- Versatile sowing period and winter hardy
- A well grown crop of VITASSO can significantly improve the profitability of potato crops through increased yields, improved quality and reduced use of pesticides

**Sowing Period:** Apr-Oct  
**Sowing Depth:** 1-2cm  
**Sowing Rate:** 5kg/ha  
**Winter Hardy:** Yes

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**Establishment期期**

Forage Species

- *Brassica juncea*

**Establishment期期**

Forage Species

- *Sinapis alba*

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*Brown mustard usually withstands temperature down to -5°C.*
**Tillage Radish**

<table>
<thead>
<tr>
<th>Variety</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAIKON</td>
<td>Very quick to establish, good weed suppressant, long term permanent, efficient nitrogen fixing, tender to frosts.</td>
</tr>
<tr>
<td>STRUCTURATOR</td>
<td>Very quick to establish, excellent nitrogen fixation, tender to frosts.</td>
</tr>
</tbody>
</table>

**Raphanus sativus**

**Oil Radish**

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMAGE</td>
<td>Late to mature, offering a prolonged vegetative growth period, good resistance to lodging, good biomass production.</td>
</tr>
<tr>
<td>PINA</td>
<td>Quick to establish and late to mature, effective in mixtures and as a standalone crop, high biomass production.</td>
</tr>
</tbody>
</table>

**Raphanus sativus**

**Key Species**

<table>
<thead>
<tr>
<th>Species</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHACELIA</td>
<td>Very quick to establish, efficient nitrogen fixation, tender to frosts.</td>
</tr>
<tr>
<td>LUCERNE</td>
<td>Nitrogen fixing, very quick growing, tender to frost, excellent weed suppressant, good companion to oats.</td>
</tr>
<tr>
<td>ETHIOPIAN MUSTARD</td>
<td>Nitrogen fixing, fast growing, easy to establish, efficient weed suppressant, very leafy canopy.</td>
</tr>
<tr>
<td>LINSEED</td>
<td>Easy and quick to establish, suits thinner soils, good companion to legumes, fibrous root structure.</td>
</tr>
<tr>
<td>LINSEED</td>
<td>Efficient nitrogen fixation, very quick growing, tender to frost, good companion to oats.</td>
</tr>
</tbody>
</table>

**Other Species**

<table>
<thead>
<tr>
<th>Species</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRIMSON CLOVER</td>
<td>Nitrogen fixing, very quick growing, tender to frost, excellent weed suppressant, very leafy canopy.</td>
</tr>
<tr>
<td>BUCKWHEAT</td>
<td>Nitrogen fixing, very quick growing, tender to frost, excellent weed suppressant, good companion to oats.</td>
</tr>
<tr>
<td>BERSEEM CLOVER</td>
<td>Nitrogen fixing, very quick growing, tender to frost, excellent weed suppressant, good companion to oats.</td>
</tr>
<tr>
<td>ETHIOPIAN MUSTARD</td>
<td>Nitrogen fixing, fast growing, easy to establish, efficient weed suppressant, very leafy canopy.</td>
</tr>
<tr>
<td>LINSEED</td>
<td>Easy and quick to establish, suits thinner soils, good companion to legumes, fibrous root structure.</td>
</tr>
<tr>
<td>LINSEED</td>
<td>Efficient nitrogen fixation, very quick growing, tender to frost, good companion to oats.</td>
</tr>
</tbody>
</table>
Our most popular cover crop mixture comprising rye and winter vetch, the ideal mixture to go through the winter. SLOVENA which has a prolonged growing season and favours nitrogen at lower temperatures than other legumes. Rye develops a strong root structure to scavenge nitrogen and provide good ground cover to suppress weeds.

**Fixes and catches nitrogen**
**Overwinters**
**Low cost**
**Good weed suppression**

**Contents:**
- 80% TURBOGREEN Rye
- 20% SLOVENA Vetch

**Sowing Rate:**
- 35-50kg/ha

---

Suitable for early autumn sowing with high dry matter production. Phacelia puts on a large amount of growth in a short period of time. The three different rooting structures improve soil structure and scavenge nitrogen. The inclusion of rye ensures cover through the winter even once the phacelia and vetch have been killed by frost.

**Fixes and catches nitrogen**
**Overwinters**
**Low cost**
**Good weed suppression**

**Contents:**
- 80% TURBOGREEN Rye
- 15% KWARTA Vetch
- 5% STALA Phacelia

**Sowing Rate:**
- 35kg/ha

---

Suitable for early autumn sowing where high biomass is required but mixture is not required to overwinter. DELUX is exceptionally quick to establish but late to mature, reducing risk of unwanted seed shed. KWARTA vetch establishes and grows quickly in the autumn.

**Best sown in early autumn**
**Short term, very quick growing**
**Fixes and catches nitrogen**

**Contents:**
- 70% DELUX Black Oats
- 30% KWARTA Vetch

**Sowing Rate:**
- 25-35kg/ha

---

Can be sown down to 25kg/ha for the most economical cover or catch crop solution. White mustard is quick to establish and fast growing. As it is tender to frost, it is also easy to incorporate in to the soil. Together with the prostrate growth of rye, this mixture is good at suppressing weeds, as it still gives good ground cover through the winter.

**Fixes nitrogen highly**
**Covers ground through winter**
**Fast establishment**
**Good weed suppression**

**Contents:**
- 80% DELUX Black Oats
- 15% ANNA Oil Radish
- 5% SCALA Brown Mustard

**Sowing Rate:**
- 25kg/ha

---

Suitable for early autumn sowing where high biomass is required but mixture is not required to overwinter. DELUX is exceptionally quick to establish but late to mature, reducing risk of unwanted seed shed. KWARTA vetch establishes and grows quickly in the autumn.

**Best sown in early autumn**
**Short term, very quick growing**
**Fixes and catches nitrogen**

**Contents:**
- 70% DELUX Black Oats
- 30% KWARTA Vetch

**Sowing Rate:**
- 25-35kg/ha

---

Suitable for use as an over winter winter cover crop as rye and brown mustard are frost tolerant.

**Very quick growth**
**Catches nitrogen very quickly**
**Suitable for catch crop**
**Covers ground through winter**

**Contents:**
- 80% TURBOGREEN Rye
- 20% SUNSHINE White Mustard

**Sowing Rate:**
- 25-50kg/ha

---

Suitable for use as an over winter winter cover crop as rye and brown mustard are frost tolerant.

**Very quick growth**
**Catches nitrogen very quickly**
**Suitable for catch crop**
**Covers ground through winter**

**Contents:**
- 80% TURBOGREEN Rye
- 15% KWARTA Vetch
- 5% STALA Phacelia

**Sowing Rate:**
- 35kg/ha

---

Great mixture for scavenging nitrogen from the soil. White mustard and phacelia establish and grow very quickly, making this mixture particularly good for growing over the short catch crop period for EFAs. Suitable for use as an over winter cover crop as rye and brown mustard are frost tolerant.

**Very quick growth**
**Catches nitrogen very quickly**
**Suitable for catch crop**
**Covers ground through winter**

**Contents:**
- 80% TURBOGREEN Rye
- 15% SCALA Brown Mustard
- 5% STALA Phacelia

**Sowing Rate:**
- 25kg/ha

---

Suitable for use as an over winter winter cover crop as rye and brown mustard are frost tolerant.

**Very quick growth**
**Catches nitrogen very quickly**
**Suitable for catch crop**
**Covers ground through winter**

**Contents:**
- 80% TURBOGREEN Rye
- 15% SUNSHINE White Mustard
- 5% SCALA Brown Mustard

**Sowing Rate:**
- 25kg/ha

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Great mixture to improve soil structure and provide plenty of top growth. Fibrous roots of black oats and deep rooting radish break up soil compaction and improve soil quality. Black oats produce large amounts of dry matter and scavenge nitrogen.

**Diverse mixture**
**Good for soil structure**
**High dry matter**
**Catches nitrogen**

**Contents:**
- 60% TURBOGREEN Rye
- 25% SUNSHINE White Mustard
- 10% SCALA Brown Mustard
- 5% STALA Phacelia

**Sowing Rate:**
- 25kg/ha

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We reserve the right to substitute similar varieties dependent on availability.

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HYDROMAX
Cost effective solution for fast establishment and good ground cover to suppress weeds. Can be used effectively to improve soil structure and take moisture out of the soil over a short period of time. When turned over in to the soil, brown mustard has a biofumigation effect.

- Deep, fibrous roots
- Good weed suppression
- Catches nitrogen
- Low cost

Contents:
- 70% SUNSHINE White Mustard
- 30% SCALA Brown Mustard

Sowing Rate: 12.5kg/ha

NEMASHIELD
New for 2016, created specifically to target soil borne pathogens. Nemashield contains type 2 resistant varieties of both white mustard and oil radish to maximise control of beet cyst nematode (Heterodera schachtii).

- Powerful anti-nematode effect
- Breaks up soil compaction
- High biomass production
- Scavenges nitrogen

Contents:
- 50% IRIS White Mustard
- 50% PINA Oil Radish

Sowing Rate: 25kg/ha

We reserve the right to substitute similar varieties dependent on availability.

Information provided above is given in good faith and should act as a guide only. Local conditions, weather and crop rotations must always be taken in to account.

<table>
<thead>
<tr>
<th>Species</th>
<th>Latin Name</th>
<th>Type</th>
<th>Sowing Rate</th>
<th>Sowing Depth</th>
<th>Sowing Period</th>
<th>Nitrogen Fix</th>
<th>Leaching Prevention</th>
<th>Organic Matter</th>
<th>Soil Structure</th>
<th>Biofumigation</th>
<th>Allelopathic</th>
<th>Nematode Control</th>
<th>Weed Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSTARD</td>
<td>Brown Brassica juncea</td>
<td>Brassica</td>
<td>5kg</td>
<td>1-2cm</td>
<td>Apr-Oct</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>White Sinapis alba</td>
<td>Brassica</td>
<td>10-15kg</td>
<td>0.5cm</td>
<td>Apr-Sept</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>White (type 2) Sinapis alba</td>
<td>Brassica</td>
<td>10-15kg</td>
<td>0.5cm</td>
<td>Apr-Sept</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td></td>
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<tr>
<td>Ethiopian Mustard</td>
<td>Brassica carinata</td>
<td>Brassica</td>
<td>15kg</td>
<td>2-3cm</td>
<td>May-Aug</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>VETCH</td>
<td>Common Vicia sativa</td>
<td>Legume</td>
<td>50kg</td>
<td>1-2cm</td>
<td>Mar-Oct</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Hairy Vicia villosa</td>
<td>Legume</td>
<td>25kg</td>
<td>2-3cm</td>
<td>Apr-Aug</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>OIL RADISH</td>
<td>Classic Raphanus sativus</td>
<td>Brassica</td>
<td>10-15kg</td>
<td>1-2cm</td>
<td>Apr-Sept</td>
<td>YES</td>
<td>NO</td>
<td></td>
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</tr>
<tr>
<td>Type 2 Raphanus sativus</td>
<td>Brassica</td>
<td>10-25kg</td>
<td>1-2cm</td>
<td>Apr-Sept</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
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<td></td>
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<tr>
<td>Type 1 Raphanus sativus</td>
<td>Brassica</td>
<td>10-25kg</td>
<td>1-2cm</td>
<td>Apr-Sept</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
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<tr>
<td>Tillage Raphanus sativus</td>
<td>Brassica</td>
<td>10-15kg</td>
<td>1-2cm</td>
<td>Apr-Aug</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>OTHER SPECIES</td>
<td>Berseem Clover Trifolium alexandrinum</td>
<td>Legume</td>
<td>15kg</td>
<td>1cm</td>
<td>Mar-Aug</td>
<td>NO</td>
<td>NO</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Black Oats</td>
<td>Avena strigosa</td>
<td>Cereal</td>
<td>30-50kg</td>
<td>1-2cm</td>
<td>Aug-Oct</td>
<td>YES</td>
<td>YES</td>
<td></td>
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<tr>
<td>Buckwheat</td>
<td>Fagopyrum esculentum</td>
<td>Polygonaceae</td>
<td>70kg</td>
<td>2-3cm</td>
<td>May-Aug</td>
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<td>NO</td>
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<tr>
<td>Crimson Clover</td>
<td>Trifolium incarnatum</td>
<td>Legume</td>
<td>15kg</td>
<td>1cm</td>
<td>Aug-Sept</td>
<td>NO</td>
<td>YES</td>
<td></td>
<td>NO</td>
<td></td>
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</tr>
<tr>
<td>Linseed</td>
<td>Linum ultimassimum</td>
<td>Linum</td>
<td>50kg</td>
<td>2-3cm</td>
<td>Apr-Aug</td>
<td>NO</td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linseed</td>
<td>Linum ustulatum</td>
<td>Linum</td>
<td>50kg</td>
<td>2-3cm</td>
<td>Apr-Aug</td>
<td>NO</td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niger</td>
<td>Guizotia abyssinica</td>
<td>Asteraceae</td>
<td>5kg</td>
<td>1-2cm</td>
<td>Mar-Aug</td>
<td>NO</td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phacelia</td>
<td>Phacelia tanacetifolia</td>
<td>Boraginaceae</td>
<td>5-8kg</td>
<td>0.5cm</td>
<td>Mar-Aug</td>
<td>YES</td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rye</td>
<td>Secale cereale</td>
<td>Cereal</td>
<td>30-50kg</td>
<td>1-2cm</td>
<td>Aug-Oct</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Sunflower</td>
<td>Helianthus annuus</td>
<td>Asteraceae</td>
<td>12.5kg</td>
<td>2-3cm</td>
<td>Apr-Aug</td>
<td>NO</td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIXTURES</td>
<td>Grabber Mixture</td>
<td>35-50kg</td>
<td>1-2cm</td>
<td>Aug-Oct</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Autumn DM Mixture</td>
<td>35kg</td>
<td>1-2cm</td>
<td>Mar-Sept</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td>YES</td>
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</tr>
<tr>
<td>EcoCover Mixture</td>
<td>25-50kg</td>
<td>1-2cm</td>
<td>Aug-Sept</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<td>YES</td>
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<tr>
<td>CatchMore Mixture</td>
<td>25kg</td>
<td>1-2cm</td>
<td>Aug-Sept</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Sprinter Mixture</td>
<td>25-35kg</td>
<td>1-2cm</td>
<td>Aug-Oct</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td></td>
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<tr>
<td>Soil Revivor Mixture</td>
<td>25kg</td>
<td>1-2cm</td>
<td>Aug-Sept</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Pan Buster Mixture</td>
<td>10-15kg</td>
<td>1-2cm</td>
<td>Apr-Sept</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>HydroMax Mixture</td>
<td>12.5kg</td>
<td>1-2cm</td>
<td>Apr-Sept</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>NemaShield Mixture</td>
<td>25kg</td>
<td>1-2cm</td>
<td>Apr-Sept</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Primary Characteristics
- Competitive throw
- Deep fibrous roots
- Good weed suppression
- Catches nitrogen
- Low cost

Secondary Characteristics
- Powerful anti-nematode effect
- Breaks up soil compaction
- High biomass production
- Scavenges nitrogen

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We reserve the right to substitute similar varieties dependent on availability.

Information provided above is given in good faith and should act as a guide only. Local conditions, weather and crop rotations must always be taken in to account.
COMPOSING A MIXTURE

Openfield offers a comprehensive range of cover crop mixtures but extends to bespoke mixtures also. Composing a mixture that is both viable and economical can be challenging – the three steps below offer some methodology to enable you to do so.

1 Identify the Priorities
- Organic Matter
- Soil Structure
- Biofumigation
- Pest Control
- Allelopathy
- Nematodes
- Type 1 nematode resistance
- Type 2 nematode resistance
- NitrogenFixation
- OrganicMatter
- LeachingPrevention
- Winter Hardiness, Frost Tolerant and Over Winter Use

2 Duration
- Sowing Date
- Winter Hardiness
- EFA Compliance
- Risk of Seed Shed
- Sowing Depth
- Management
- Cost

3 Practicalities
- RotationalConflict
- SeedRate
- Seed Size
- Winter Over Winter Use
- RotationalConflict
- Seed Rate
- Seed Size
- Sowing Depth
- Management
- Cost

AVOID...
Inappropriate seed rates – mixture percentages are based on weight rather than seed number. For example, there are over ten times the number of seeds per gram of phacelia than rye. More than five species in a mixture – low quantities of lots of species will have little positive effect on the soil.

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GLOSSARY

Allelopathy
Wood growth can be inhibited by growing allelopathic varieties of black oats. This doesn’t affect the following crop as long as a minimum of two weeks is left after incorporation before sowing. See page 5 for more details.

Biofumigation
The process of using plant chemicals to suppress soil-borne pathogens, nematodes, insects and weeds. More information can be found on page 4.

Carbon/Nitrogen Ratio
The ratio of the weight of organic carbon to the weight of total nitrogen in soil. Micro-organisms in the soil must balance the concentration of nitrogen to carbon in their cells, so if a bacterial colony consumes a lot of carbon and expands, it must also find enough extra nitrogen to keep its own C/N ratio the same as the original community. This can lead to a shortage of available nitrogen for crops.

Clubroot Resistance
Raphanus sativus is clubroot resistant as a species – therefore referring to specific varieties as ‘clubroot resistant’ is misleading. White mustard on the other hand is susceptible to clubroot.

Green Manure
Plant material incorporated into the soil while green, or soon after maturity.

Nematodes
Microscopic worms abundant in many soils, of which there are thousands of species. Certain varieties can reduce nematode populations in the soil – see page 5 for more details.

Type 1 nematode resistant varieties have the ability to reduce nematode populations by up to 90%.

Type 2 nematode resistant varieties have the ability to reduce nematode populations by up to 85%.

Nitrogen Fixation
The biological conversion of elemental nitrogen to organic combinations or to forms readily utilised in biological processes.

Organic Matter
The soil content comprising plant and animal residues at differing stages of decomposition.

Raphanus sativus
Fodder Radish, Oil Radish, Classic, Type 1, Type 2, Tillage Radish, Daikon
- All of these terms refer to the same species - Raphanus sativus.

Soil Erosion
The loss of soil through water, wind, ice or other geographical agents.

Winter Hardy, Frost Tolerant and Over Winter Use
References to winter hardiness, frost tolerance and over winter usage are made throughout this guide. However these factors are nearly affected by weather, sowing date, location and many other factors. Therefore, this information is given as a broad indication only and should be treated accordingly.