



Carbon4Grass

Off-setting your carbon footprint
through grass



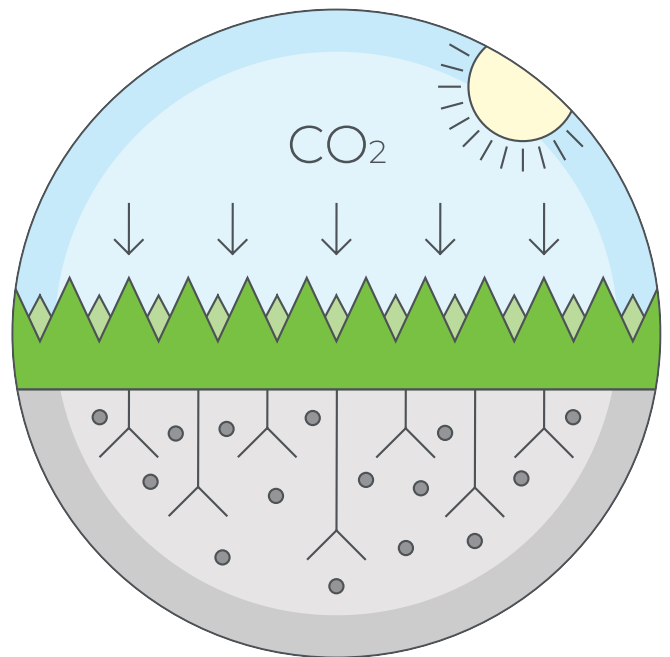
Carbon4Grass is a range of grass seed mixes that have been developed to support the industry's awareness of carbon mitigation in amenity and landscaped areas. The Carbon4Grass mixes contain cultivars that sequester relatively more carbon than typical grass seed mixes, offsetting carbon greenhouse gas emissions by machinery and equipment used on-site.

The greenhouse effect

Grasses, just like trees are chlorophyll-based plants, absorbing carbon dioxide (CO₂) from the atmosphere through photosynthesis. A proportion of the absorbed carbon is transferred from the dense canopy of grasses into the fibrous root system and finally into the soil. It is estimated that one hectare of natural, open grassland can sequester up to 2.5 tonnes of CO_{2eq} per annum, creating a net carbon sink within the soil profile.

Managed turf

Intensively managed amenity grass surfaces such as golf courses and playing fields, will have a considerable impact on the environment than typical rural grasslands. With frequent maintenance and mowing the carbon footprint increases, reinforcing the case for Carbon4Grass seed mixes that mitigate the impact of carbon production.



Carbon is absorbed through grass canopy during photosynthesis and sequestered through the fibrous root system into the soil as plants senesce and decompose.

Carbon4Grass seed mixes

Our range of Carbon4Grass mixes can help towards the impact your sports ground, golf course or amenity area contributes towards the environment.

- Absorb carbon dioxide
- Transfer CO₂ from the sward and roots into the soil
- Specially selected Carbon4Grass cultivars sequester more CO₂
- Choice of 10 specialist mixes available for a variety of applications
- Highest quality grass seed



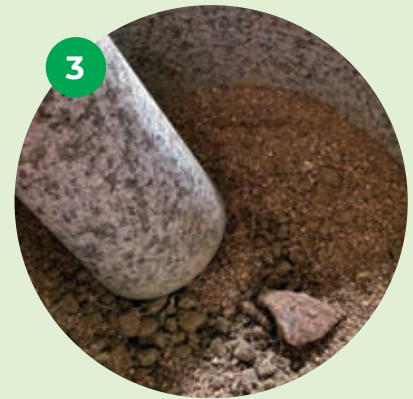
The carbon measurement process



1 Three samples are taken from 1m² grass plots. The carbon content of the soils was measured prior to sowing.



2 Each sample is divided into three sections, 0 – 15mm, 16 – 50mm, 51-70mm and dried until all humidity is removed.



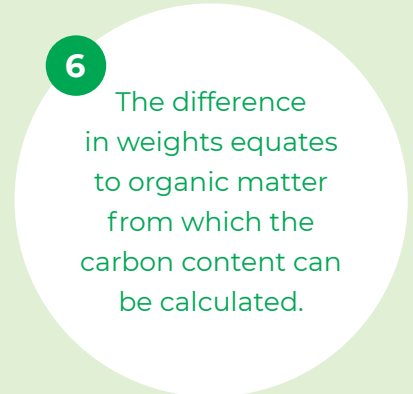
3 Each sample is finely ground and weighed to 1/1000th of a gram.



4 Samples are heated to 450°C for 8 hours to burn off the organic matter.



5 When stabilised at room temperature the sample is re-weighed.



Each trial plot receives the same treatment, number and height of cuts, fertilisation, etc.



Super Root

Tetraploid and creeping rye with creeping red fescue

- 30% Tetrastar:** Tetraploid perennial ryegrass
- 20% Creepstar:** Creeping perennial ryegrass
- 30% Greensky:** Perennial ryegrass
- 20% Hastings:** Strong creeping red fescue

Where to use

- Parks and playing fields
- Cricket outfield
- Golf tees, fairways, semi-roughs and walkways
- Hard-wearing lawns and landscaping
- Stabilisation, embankments, drought tolerance
- Terraseeding and hydroseeding
- Permeable cellular paving systems

Order code: OAI000866

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
30 – 40g/m ²	15 – 25g/m ²	4 – 8mm	Down to 7mm



Tetraploid Technology



Rapid Establishment



Strong Roots



Wear Tolerant



Shade Tolerant



Drought Tolerant

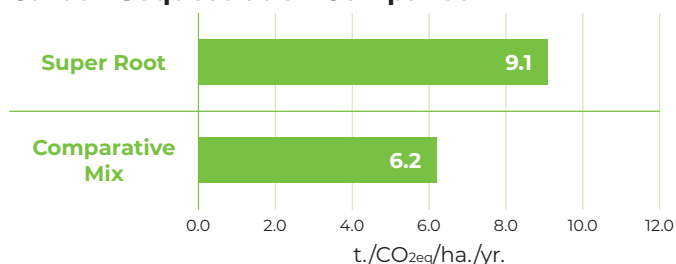


Cold Tolerant



Disease Tolerant

Carbon Sequestration Comparison



Low Maintenance

Low maintenance ultra-fine rye and fescues

- 15% Angelina:** Perennial ryegrass
- 15% Creepstar:** Creeping perennial ryegrass
- 40% Hastings:** Strong creeping red fescue
- 15% Dumas 1:** Hard fescue
- 15% Quatro:** Sheep's fescue

Where to use

- Landscaping where low maintenance and fast establishment is vital
- Reduced mowing, Angelina is the shortest re-growth ultra-fine rye
- Stabilisation and recovery with Creepstar ultra-fine creeping rye
- Golf tees, fairways and semi-roughs
- Cricket outfield
- Hard wearing, dense and drought tolerant

Order code: OAI000861

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
25 – 40g/m ²	15 – 25g/m ²	4 – 8mm	Down to 7mm



Rapid Establishment



Strong Roots



High Shoot Density



Wear Tolerant

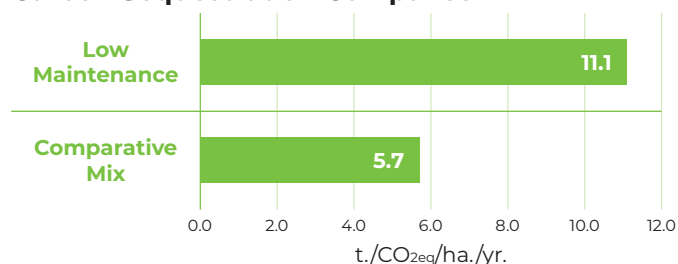


Shade Tolerant



Drought Tolerant

Carbon Sequestration Comparison





R450 Road and Rail

Rye, fescue and bent with micro-clover

25% Greenway: Perennial ryegrass

42.5% Maxima: Strong creeping red fescue

25% Dumas 1: Hard fescue

5% Highland: Bent

2.5% Pipolina: Micro-clover

Where to use

- Verges, roundabouts, road and rail embankments
- Impoverished soils, micro-clover fixes nitrogen in the soil
- Soil stabilisation, fast establishment and a high percentage of creeping grasses
- Reduced mowing, annual sward growth <250mm under a single spring cut regime

Order code: OAI000852

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
25 – 40g/m ²	15 – 25g/m ²	4 – 6mm	Down to 12mm

Rapid Establishment

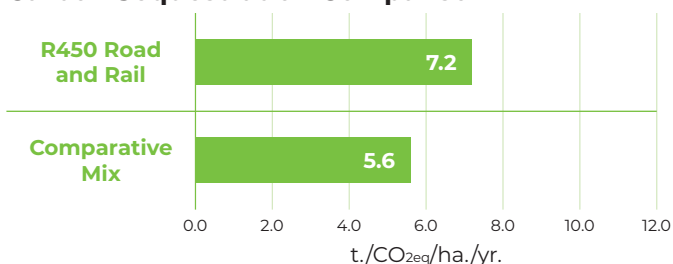
Fine Leaved

High Shoot Density

Wear Tolerant

Drought Tolerant

Carbon Sequestration Comparison



Drought

100% tall fescue

50% Granditte: Rhizomatous tall fescue

50% Essential: Tall fescue

Where to use

- Heat and drought
- Wear tolerance, once established
- Landscaping, pitches, grass walkways
- Coastal areas prone to salt-laden winds
- Sow in warmer soils, minimum 10°C, April through September
- New sowings or worn, bare areas

Order code: OAI007447

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
35 – 50g/m ²	30 – 35g/m ²	12 – 15mm	Down to 12mm

Tetraploid Technology

Strong Roots

Year-round Colour

Wear Tolerant

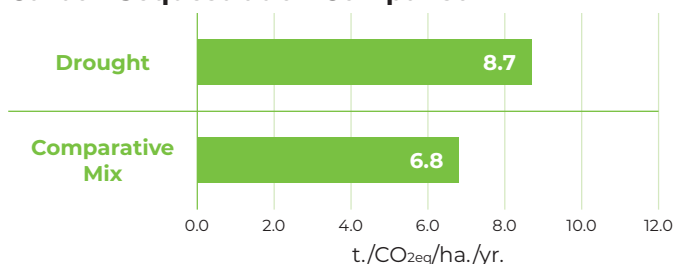
Drought Tolerant

Cold Tolerant

Disease Tolerant

Salt Tolerant

Carbon Sequestration Comparison





Sports Field Renovation

Tetraploid and diploid perennial ryegrass blend

- 25% Tetragame:** Tetraploid perennial ryegrass
- 25% Tetragreen:** Tetraploid perennial ryegrass
- 25% Columbine:** Perennial ryegrass
- 25% Berlioz 1:** Perennial ryegrass

Where to use

- Sports pitches and playing fields
- Racecourses
- Golf tees and grass walkways
- Renovation plus autumn overseeding
- Cold temperature germination from 4°C

Order code: OAI001032

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
40 – 60g/m ²	25 – 35g/m ²	12 – 15mm	Down to 12mm



Tetraploid Technology



Rapid Establishment



Strong Roots



Year-round Colour



Wear Tolerant



Shade Tolerant



Drought Tolerant

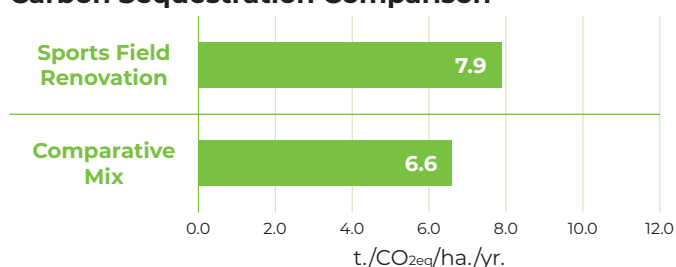


Cold Tolerant



Disease Tolerant

Carbon Sequestration Comparison



R140

Tetraploid and diploid perennial ryegrass blend

- 25% Fabian:** Tetraploid perennial ryegrass
- 25% Tetrastar:** Tetraploid perennial ryegrass
- 25% EuroCordus:** Perennial ryegrass
- 25% Columbine:** Perennial ryegrass

Where to use

- Stadium pitches and training grounds
- Sports pitches, cricket outfield and playing fields
- Racecourses
- Golf tees and grass walkways
- Renovation plus autumn overseeding
- Cold temperature germination from 4°C

Order code: OAI000850

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
40 – 60g/m ²	25 – 35g/m ²	12 – 15mm	Down to 12mm



Tetraploid Technology



Rapid Establishment



Strong Roots



Year-round Colour



Wear Tolerant



Shade Tolerant



Drought Tolerant

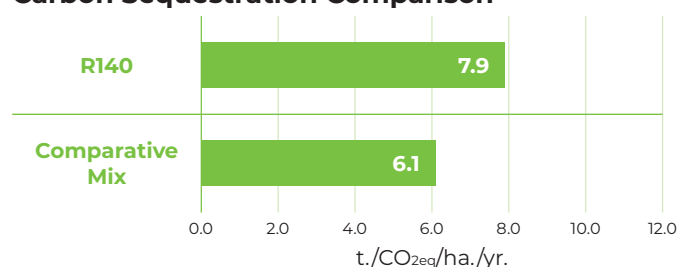


Cold Tolerant



Disease Tolerant

Carbon Sequestration Comparison





4Tetra

100% tetraploid perennial ryegrass blend

- 25% Fabian:** Tetraploid perennial ryegrass
- 25% Tetrastar:** Tetraploid perennial ryegrass
- 25% Tetragame:** Tetraploid perennial ryegrass
- 25% Tetragreen:** Tetraploid perennial ryegrass

Where to use

- Stadium pitches and training grounds
- Sports pitches, cricket outfield and playing fields
- Racecourses
- Golf tees and grass walkways
- Drought and heat tolerant
- Cold temperature germination from 4°C

Order code: OAI000868

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
40 – 60g/m ²	25 – 35g/m ²	12 – 15mm	Down to 12mm



Tetraploid Technology



Rapid Establishment



Strong Roots



Year-round Colour



Wear Tolerant



Shade Tolerant



Drought Tolerant

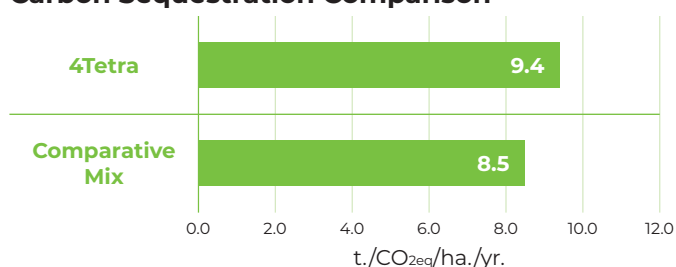


Cold Tolerant



Disease Tolerant

Carbon Sequestration Comparison



R25 CRT

Tetraploid, creeping & diploid ryegrass blend

- 25% Fabian:** Tetraploid perennial ryegrass
- 25% Creepstar:** Creeping perennial ryegrass
- 25% Cameron:** Perennial ryegrass
- 25% Angelina:** Perennial ryegrass

Where to use

- Golf tees, fairways and semi-roughs
- Sports pitches
- Racecourses
- Cricket, behind the crease, bowler's run-ups and outfield

Order code: OAI000844

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
35 – 50g/m ²	15 – 30g/m ²	10 – 15mm	Down to 7mm



Tetraploid Technology



Rapid Establishment



Strong Roots



Year-round Colour



Wear Tolerant



Shade Tolerant



Drought Tolerant

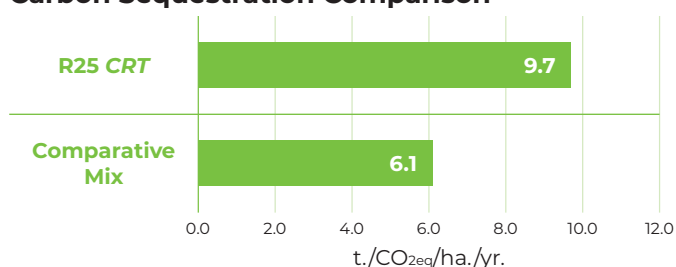


Cold Tolerant



Disease Tolerant

Carbon Sequestration Comparison





R6 CRT

Tetraploid, creeping and diploid ryes with fine fescues

- 20% Fabian:** Tetraploid perennial ryegrass
- 20% Creepstar:** Creeping perennial ryegrass
- 20% Cameron:** Perennial ryegrass
- 20% Absolom:** Slender creeping red fescue
- 20% Dumas 1:** Hard fescue

Where to use

- Golf surrounds, tees, fairways and semi-roughs
- Cricket outfield
- Drought, salt and shade tolerance

Order code: OAI000838

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
30 – 35g/m ²	15 – 25g/m ²	4 – 8mm	Down to 7mm



Tetraploid Technology



Rapid Establishment



Strong Roots



Wear Tolerant



Shade Tolerant



Drought Tolerant



Cold Tolerant

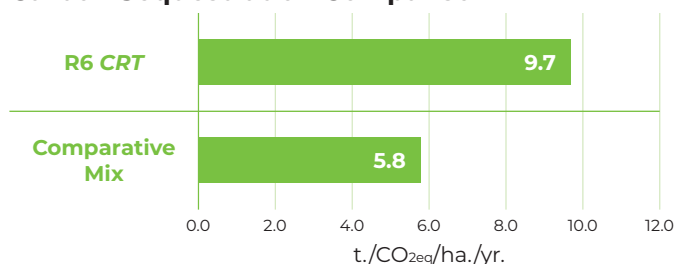


Disease Tolerant



Salt Tolerant

Carbon Sequestration Comparison



R41

100% perennial ryegrass blend

- 25% Angelina:** Perennial ryegrass
- 25% Estelle:** Perennial ryegrass
- 25% Gianna:** Perennial ryegrass
- 25% Duparc:** Perennial ryegrass

Where to use

- Golf rye greens, tees, fairways and semi-roughs
- Cricket squares and outfield
- Tennis courts
- Sports pitches, playing fields

Order code: OAI000845

Pack size: 20kg

Sowing rate	Overseeding rate	Sowing depth	Mowing height
25 – 40g/m ²	15 – 25g/m ²	12 – 15mm	Down to 4mm



Rapid Establishment



Fine Leaved



Year-round Colour

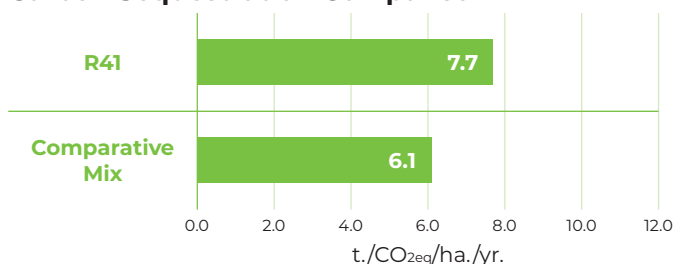


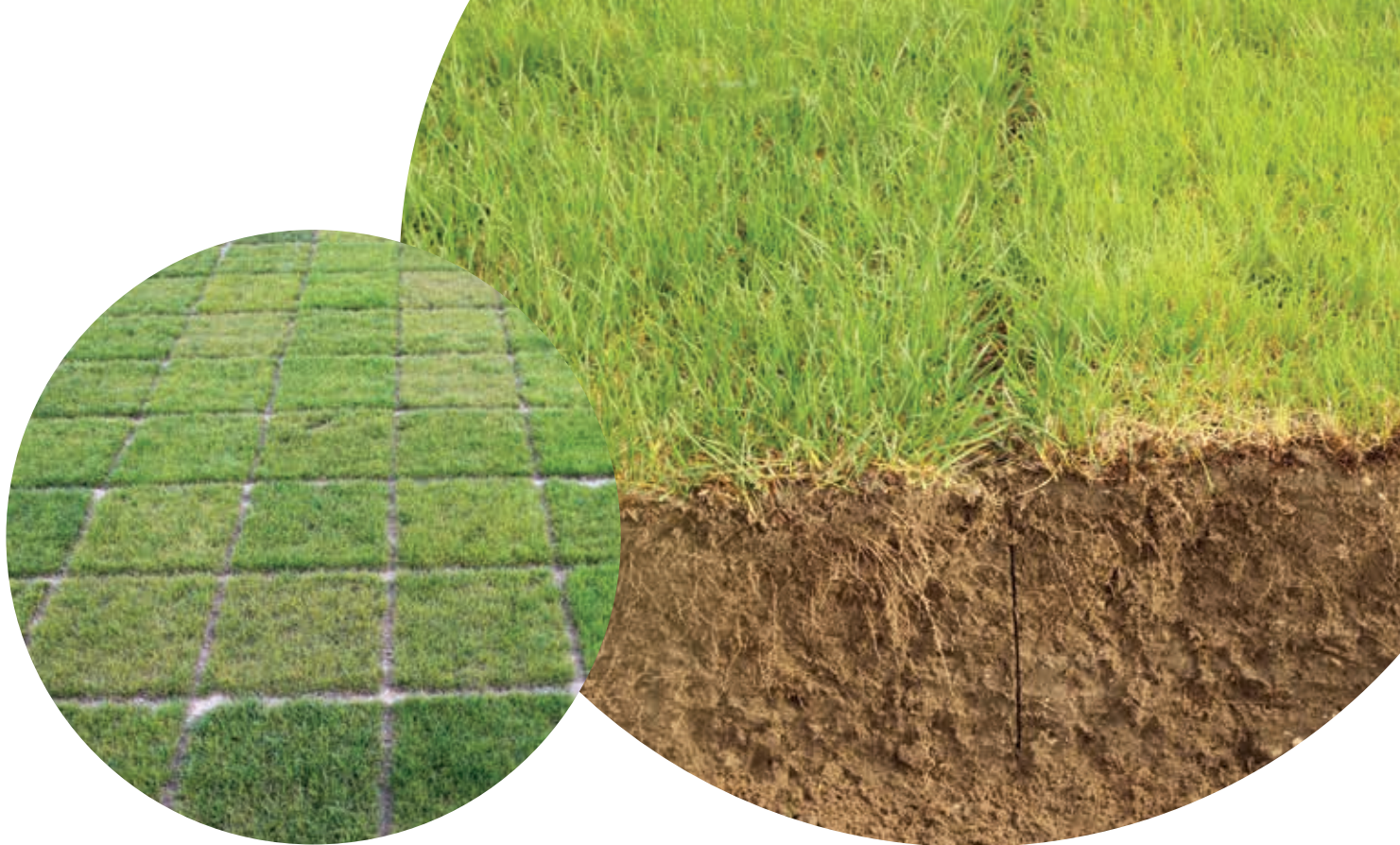
Wear Tolerant



Disease Tolerant

Carbon Sequestration Comparison





Tetraploid technology

Tetraploid perennial ryegrasses are highly valued for their fast establishment, cool temperature recovery, high root mass and greater stress tolerance

Grass breeders have over the years, developed high performance, innovative cultivars for a wide range of amenity applications. Low maintenance, slower growing cultivars with higher carbon scores have been included to help reduce the carbon footprint of maintenance tasks such as mowing or mechanical aeration. A notable innovation is hard wearing tetraploid perennial ryegrass technology, extending the growing season through cold temperature growth.

Tetraploids are actively germinating, growing and photosynthesising in colder conditions from just 4°C, thus maintaining active grass cover for longer to potentially 'capture' more carbon. Tetraploids (4n) have double the chromosomes of a diploid ryegrass (2n), meaning double the chloroplast and chlorophyll for photosynthesis. The root mass of grasses acts as a reservoir for carbon which eventually transfers into the soil profile as roots die and decompose.

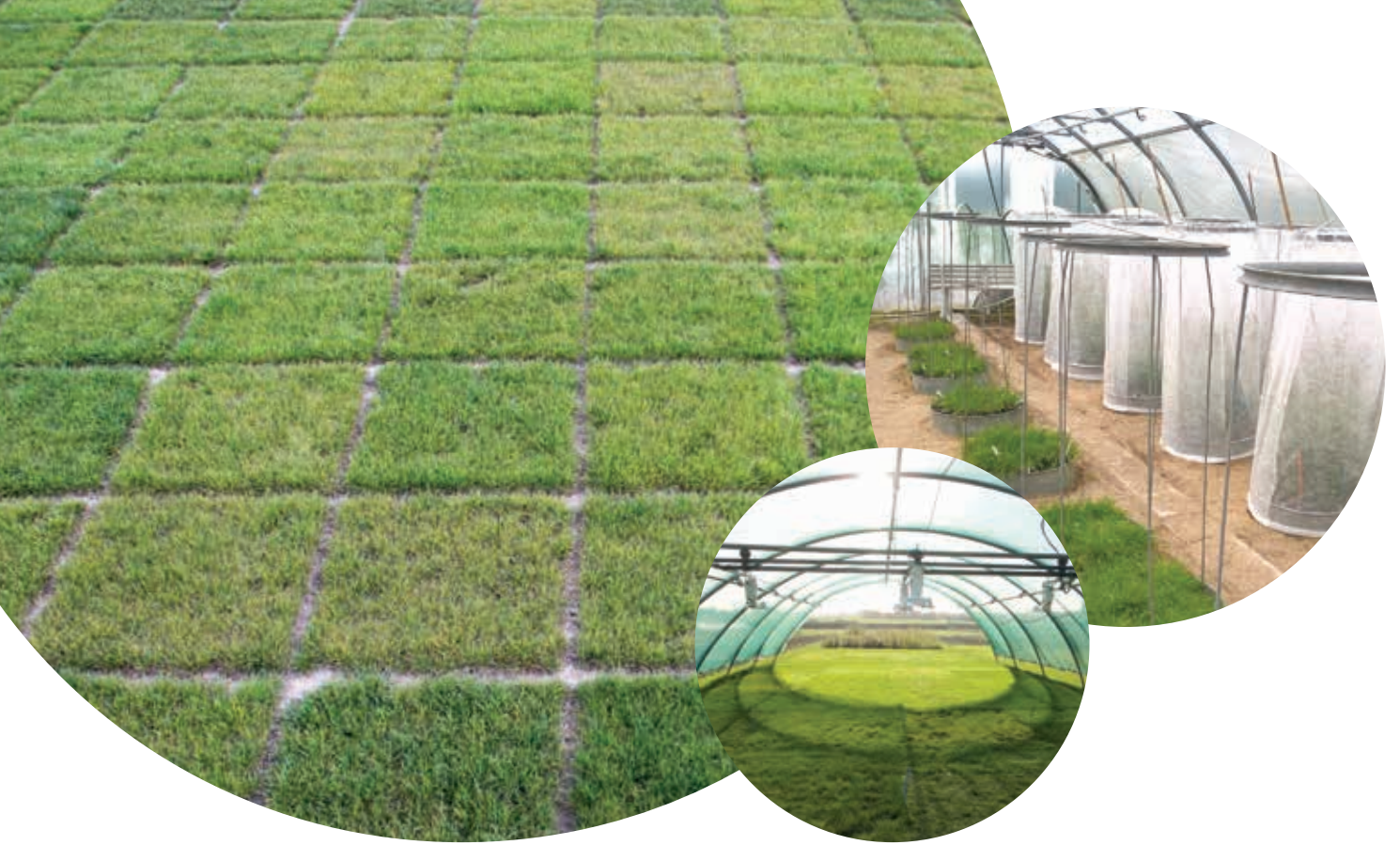
Tetraploids have a much stronger, deeper, denser root mass than diploids, delivering greater potential for higher sequestration, an important physiological feature when you consider ryegrass accounts for around 90% of the seeds used to create and maintain amenity turf in the UK.

Potential is enhanced still further with Germin-8T seed treatment, which boosts germination and establishment particularly in cooler conditions. Germin-8T also contains both Mycorrhiza and Trichoderma atroviride for symbiotic plant health. Together with tetraploid technology it enables sowing of Carbon4Grass mixtures virtually all year round.



Root mass comparison, tetraploids (L) vs diploids (R)

For more information on the benefits of Tetraploid and Germin-8T technology, please call 0800 138 7222 or email sales@originamenity.com



18 years of carbon research

Origin Amenity Solutions has been working with dedicated grass breeding and turf researchers since 2005 to identify the differences in carbon sequestration values of managed amenity grass species.

Utilising well established grass plots for the research, the study revealed significant differences between each cultivar and their capacity to store and sequester carbon.

Over the years the research programmes have had many findings. Of particular note is the ability of red fescue to hold more carbon in the roots than other species, but also the in-efficiency of transferring it into the soil. Comparatively perennial ryegrass will hold the least amount of carbon but demonstrates a more efficient transfer of carbon into the ground. Studies have developed since 2005 with new cultivars from the breeding programme introduced into the research over time. The differences in the efficiency of individual cultivars to sequester carbon proved to be significant and this knowledge has been used to create a range of 10 Carbon4Grass mixes, combining increased levels of carbon sequestration potential with desirable amenity characteristics.

“The Carbon4Grass range of mixes has been developed after 18 years of controlled trial plot studies. It follows published research of carbon sequestration in trees which aroused our curiosity to the possibility that grasses could support the same concept of carbon sequestration through their ligneous roots systems and that differences must exist between species and cultivars. It has enabled the team to create a comprehensive range of Carbon4Grass mixes that is mindful of the amenity environment whilst offering carbon offset solutions for greenkeepers, landscapers and grounds maintenance professionals.”

Howard Wood
Independent Environmental Consultant



Working with you to achieve excellence





Making an impact

Changes in our climate are dramatically challenging and shaping our environment. It is within everyone's duty of care to ensure we do the utmost to minimise or offset our carbon footprint.

The range of 10 specialist Carbon4Grass mixes can help towards the impact your sports ground, golf course or amenity area contributes towards the environment.



Combined excellence

Origin Amenity Solutions combines the expertise, innovation, knowledge and experience of four leading brands – Headland Amenity, Rigby Taylor, Symbio and Turfkeeper. OAS operates at the leading-edge of plant science and turf technology working with a broad spectrum of amenity products alongside integrated pest management and microbiology programmes.

To find out more about Origin Amenity Solutions and our plans for the future of the turf industry, follow us:

 [@originamenity](https://twitter.com/originamenity)

 [@originamenitysolutions](https://www.linkedin.com/company/originamenity/)



Our brands:



www.originamenity.com