



## “Fixing” the Greenhouse Effect



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# “Fixing” the Greenhouse Effect

Rigby Taylor and its seed breeding partner Top Green, have a long and very successful relationship. Top Green’s seed breeding and research facility is situated at Les Alleuds In France and is the partnership development centre for Rigby Taylor grass seed mixtures.



## The Greenhouse Effect

The carbon cycle and carbon sequestration impact upon our everyday lives. Grasses, just like trees, are chlorophyll-based plants, absorbing carbon dioxide (CO<sub>2</sub>) from the atmosphere for use in photosynthesis.

Phytosynthesis, uses sunlight and water to convert CO<sub>2</sub> into carbohydrates and simple sugars to generate energy and growth, “fixing” greenhouse gases from the air into the soil by sequestration and providing oxygen as a bi-product; a proportion of this absorbed carbon is transferred from the dense canopy and fibrous root system into the soil as plants senesce and decompose. One hectare of natural, open grassland can sequester up to 2.5 tonnes of carbon per

annum, creating a net carbon sink held within the soil profile. A national ecological survey conducted by the universities of Manchester, Lancaster, Reading and Newcastle, together with Rothmansted Research, revealed around two billion tonnes of carbon is stored deep under the UK’s grasslands, helping to curb climate change.

*“Our findings suggest that by managing our grasslands in a less intensive way, soil carbon storage could be important to our future global carbon targets but will also bring benefits for biodiversity conservation”*

**Professor Richard Bardgett University of Manchester, 2016**

## Net Carbon Sink

All well and good on one hand for infrequently managed grassland, but what about the intensively managed amenity grass surfaces we all enjoy which, by definition, have a much greater environmental impact?

Because managed amenity turf has higher plant populations per square metre than natural grassland, having the availability of amenity cultivars which sequester (lock up) relatively more carbon can make a significant contribution in mitigating the environmental impact of essential maintenance inputs, preserving a net carbon sink. With the introduction of the **Carbon4Grass** mixtures, the opportunity is now here to select the correct grass species for a specific surface that will impact significantly on both carbon sequestration rates and management inputs, which again improves the net carbon sink figure.



*Grass and flower plantings offer great benefits to the urban landscape*



# Carbon4Grass Mixtures



## Streetscene & Green Infrastructure

### RT Super Root

30% Tetragreen	Tetraploid perennial ryegrass
20% Stolawn	Creeping perennial ryegrass
30% Greensky	Perennial ryegrass
20% Mystic	Strong creeping red fescue

Sowing rate	30-40g sq.m
Sowing depth	4-8mm
Mowing height	Down to 12mm

RT Product Code: 0323010/020

### Where to Use

Parks and playing fields  
Outfields  
Hard-wearing landscaping  
Terraseeding & Hydroseeding  
Permeable Cellular Paving Systems



### RT Low Maintenance

30% Mercitwo	Perennial ryegrass
30% Greenway	Perennial ryegrass
25% Mystic	Strong creeping red fescue
10% Dumas 1	Hard fescue
5% Denso	Browntop bent

Sowing rate	25-40g per sq.m
Sowing depth	4-6mm
Mowing height	Down to 25mm

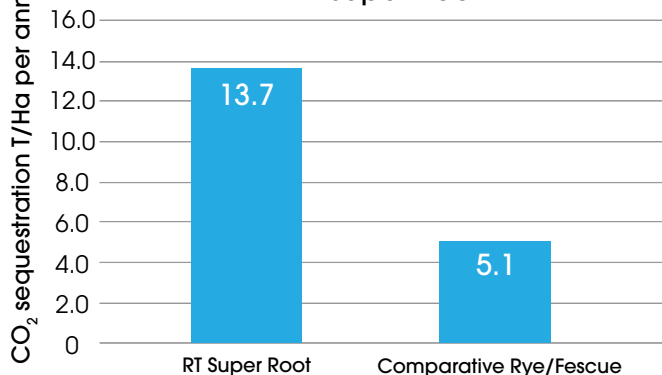
RT Product Code: 0323003/020

### Where to Use

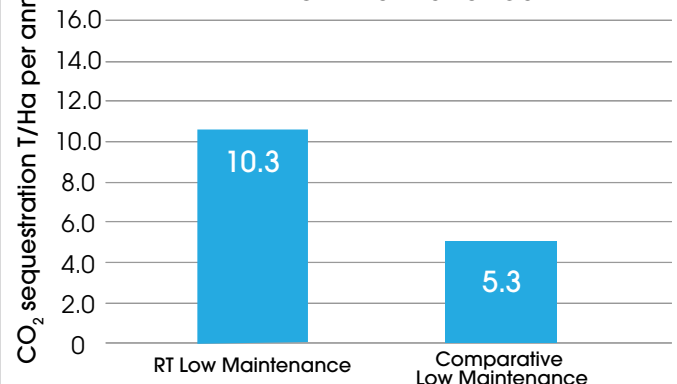
Landscaping where fast establishment and low maintenance are essential  
For low growing height with reduced mowing  
To produce a fine, dense, drought tolerant turf



Carbon Sequestration Comparison  
RT Super Root



Carbon Sequestration Comparison  
RT Low Maintenance



## R450 Road & Rail

25% Mercitwo	Perennial ryegrass
42.5% Mystic	Strong creeping red fescue
25% Dumas 1	Hard fescue
5% Denso	Browntop bent
2.5% Pipolina	Micro-clover

Sowing rate	25-40g per sq.m
Sowing depth	4-6mm
Mowing height	Down to 25mm

RT Product Code: 0322450/020

### Where to Use

Verges, roundabouts and embankments

Soil stabilisation, fast establishment with a high percentage of creeping grasses

Reduced mowing, annual sward growth <300mm under a single spring-cut regime



## R460

25% Grandite	Rhizomatous tall fescue
25% Essential	Tall fescue
25% Tetragreen	Tetraploid perennial ryegrass
25% Greenway	Perennial ryegrass

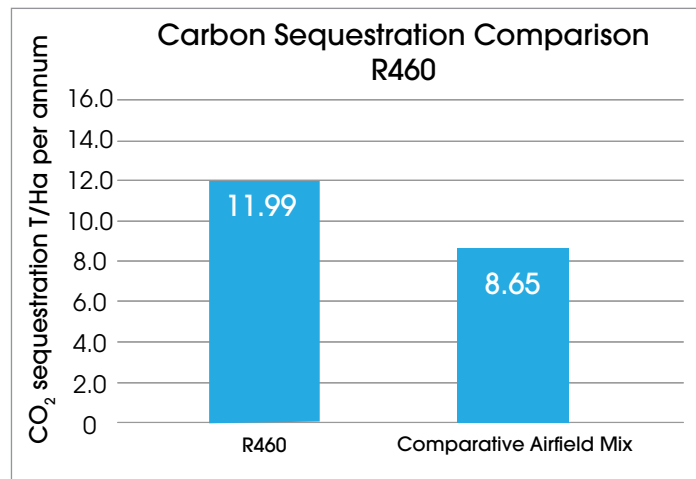
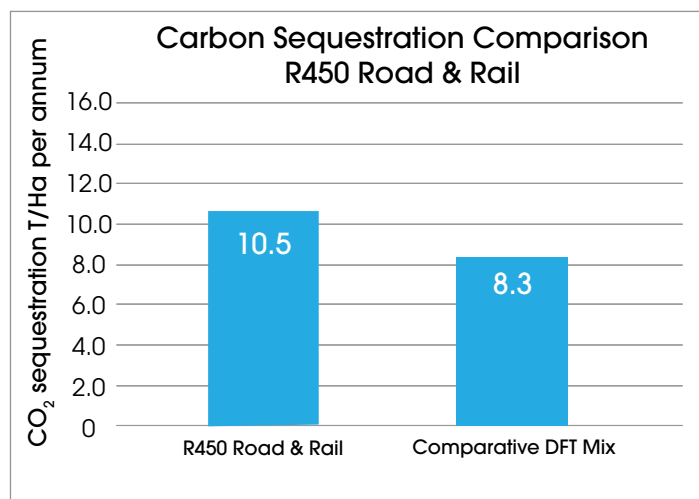
Sowing rate	35-50g sq.m
Sowing depth	10-15mm
Mowing height	Down to 25mm

RT Product Code: 0322460/020

### Where to Use

Managed airfield grassland,

Sow in warmer soil temperatures minimum 10°C





## Sports, Equestrian & Golf

### Sports Field Renovation

<b>40% Tetragreen</b>	Tetraploid perennial ryegrass
<b>30% Greensky</b>	Perennial ryegrass
<b>30% Greenway</b>	Perennial ryegrass

Sowing rate	40-60g sq.m
Sowing depth	12-15mm
Mowing height	Down to 12mm
RT Product Code:	0399558/020

### Where to Use

All sports pitches  
Racecourses



### R140

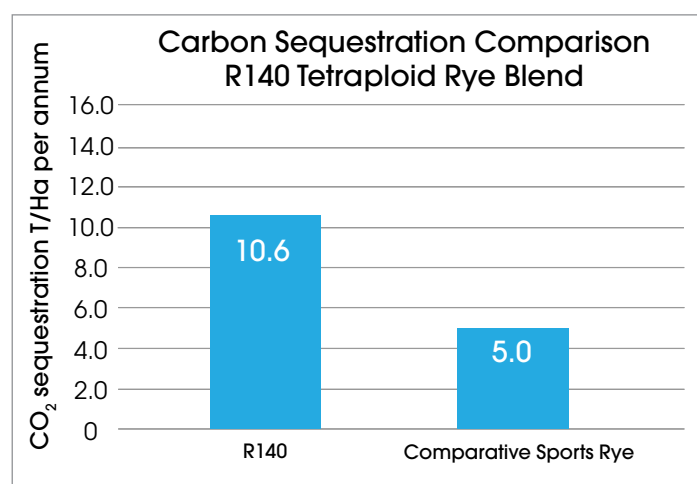
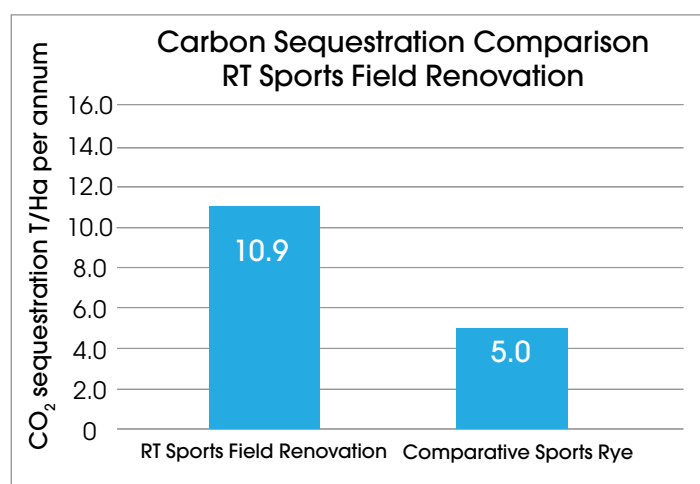
<b>25% Fabian</b>	Tetraploid perennial ryegrass
<b>25% Tetrastar</b>	Tetraploid perennial ryegrass
<b>25% Eurocordus</b>	Perennial ryegrass
<b>25% Columbine</b>	Perennial ryegrass

Sowing rate	40-60g sq.m
Overseeding rate	25-35 sq.m
Sowing depth	12-15mm
Mowing height	Down to 13mm

RT Product Code: 0322140/020

### Where to Use

All sports pitches  
Racecourses



## R25CRT

25% Fabian	Tetraploid perennial ryegrass
25% Stolawn	Creeping perennial ryegrass
25% Duparc	Perennial ryegrass
25% Gianna	Perennial ryegrass

Sowing rate	35-50g sq.m
Sowing depth	10-15mm
Mowing height	Down to 7mm

RT Product Code: 0322025/020CRT

### Where to Use

All sports pitches  
Racecourses  
Cricket, behind the crease and outfield  
Tennis courts  
Golf tees, fairways, semi-roughs



## ECO SPORT CRT

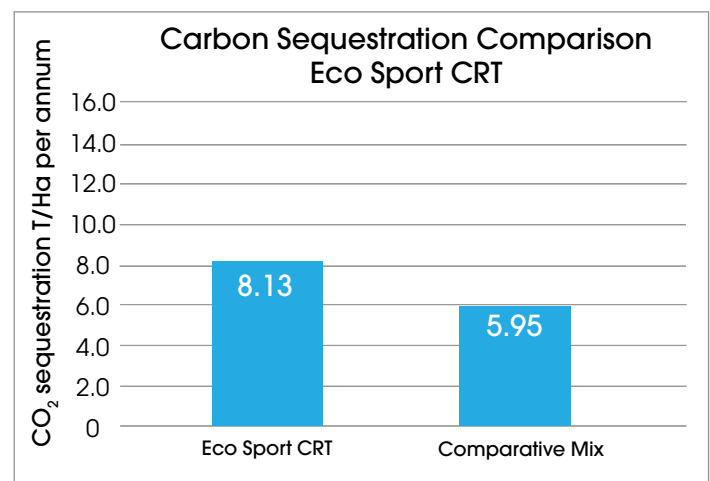
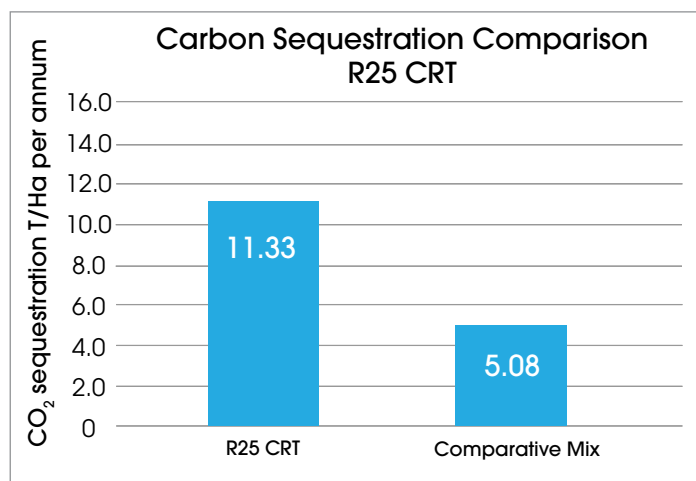
30% Tetragreen	Tetraploid perennial ryegrass
20% Fiesta 4	Creeping perennial ryegrass
25% Columbine	Perennial ryegrass
22.5% Berlioz 1	Perennial ryegrass
2.5% Pipolina	Micro-clover

Sowing rate	35-50g sq.m
Sowing depth	10-15mm
Mowing height	Down to 15mm

RT Product Code: 0399902/020

### Where to Use

Low input sports pitches with no fertiliser or irrigation  
Where micro-clover is needed for nitrogen fixation





## R91

30% **Estelle** Perennial ryegrass  
 30% **Duparc** Perennial ryegrass  
 40% **Mercitwo** Perennial ryegrass

Sowing rate 25-40g sq.m  
 Sowing depth 12-15mm  
 Mowing height Down to 7mm  
 RT Product Code: 0322091/020

### Where to Use

Golf tees, fairways, semi-roughs  
 Cricket squares and outfields  
 Tennis courts



## R6 CRT

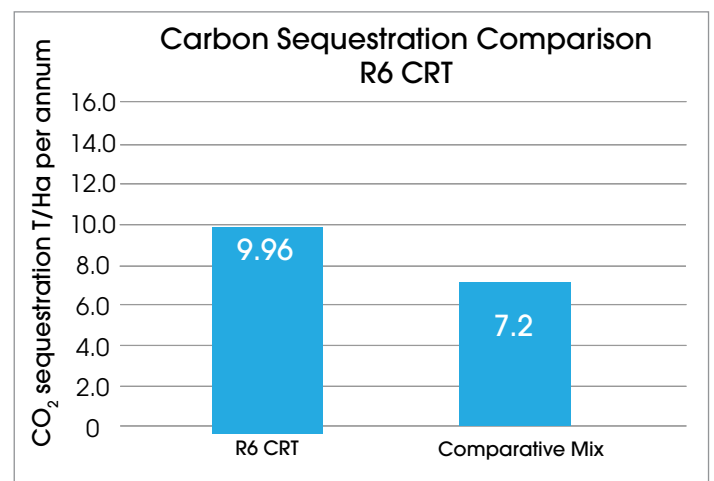
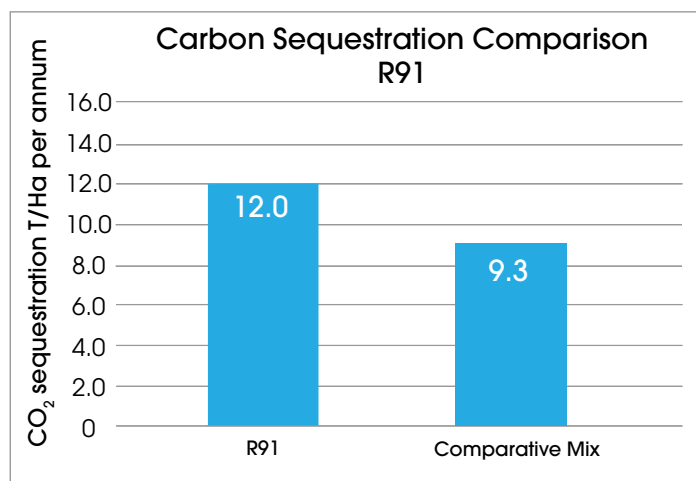
20% **Fabian** Tetraploid perennial ryegrass  
 20% **Stolawn** Perennial ryegrass  
 20% **Duparc** Perennial ryegrass  
 20% **Beudin** Slender creeping red fescue  
 20% **Dumas 1** Hard fescue

Sowing rate 30-35g sq.m  
 Sowing depth 4-8mm  
 Mowing height Down to 7mm

RT Product Code: 0322006/020CRT

### Where to Use

Golf surrounds, tees, fairways, semi-roughs  
 Cricket outfields







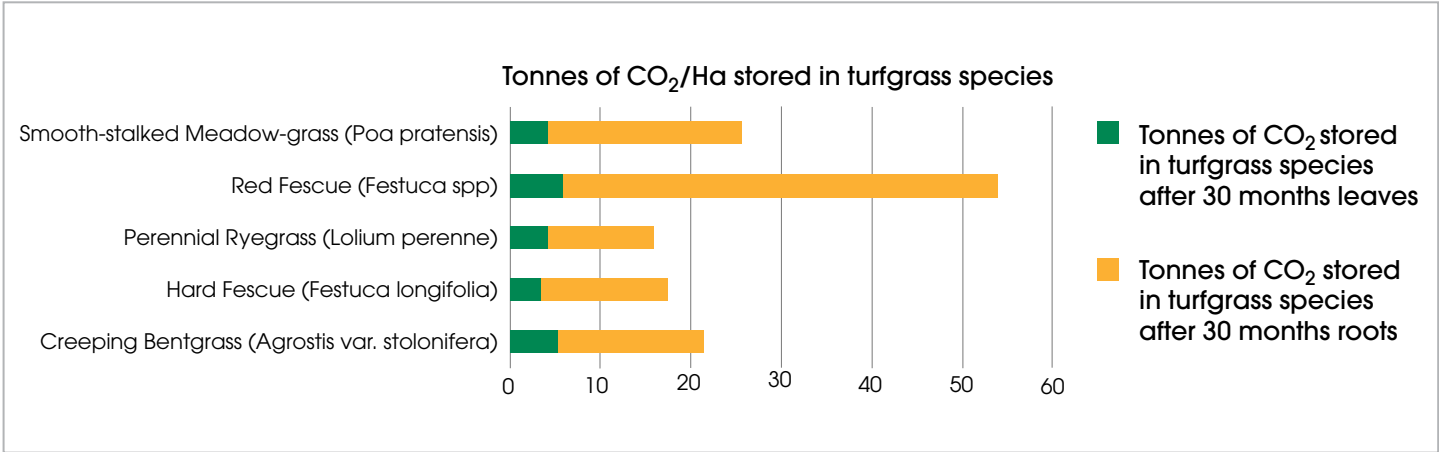
## Carbon Credentials

As the Les Alleuds study progressed the focus was on individual cultivars within species, with new cultivars from the breeding programme entered into the study over time.

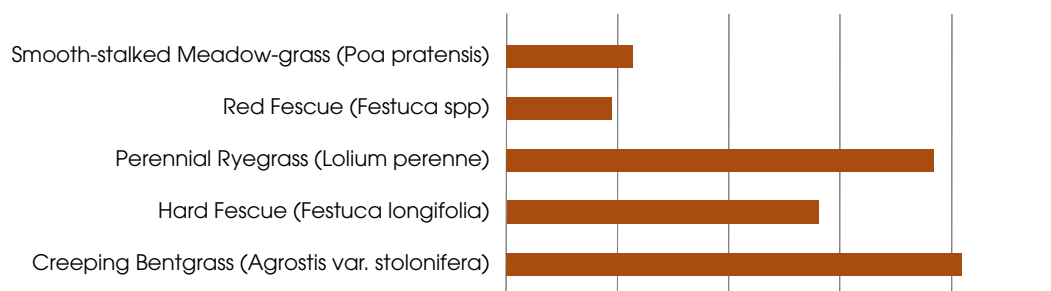
The differences in the efficiency of individual cultivars to sequester carbon proved to be significant and knowledge has been used to create the Rigby Taylor **Carbon4Grass**

mixtures, combining increased levels of carbon sequestration potential with desirable amenity characteristics.

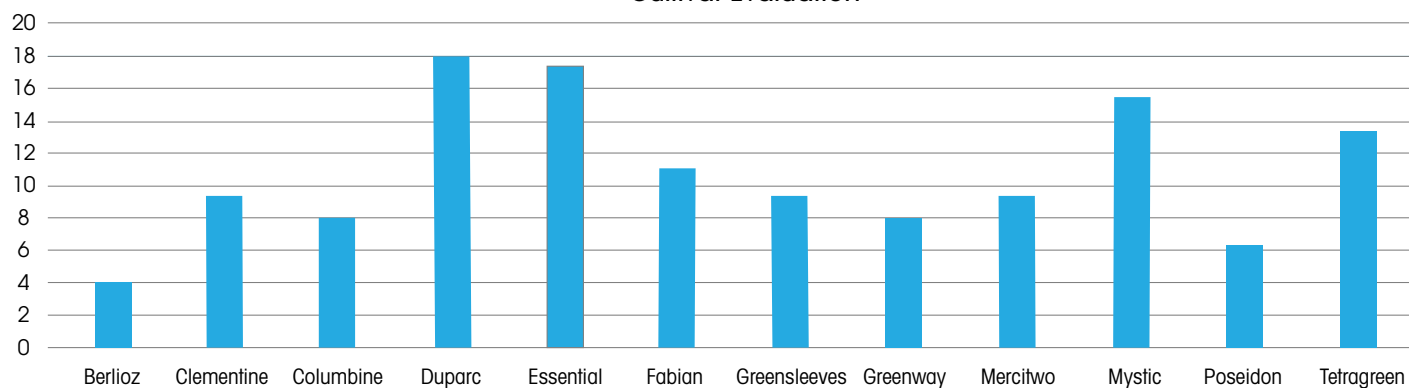
**Just two square metres of grassland can produce enough oxygen to support one person for an entire day, or for one hectare, one person for 13 years!**



Tonnes of CO<sub>2</sub>/Ha sequestered into the soil profile per annum



Tonnes CO<sub>2</sub>/Ha sequestered per annum  
Cultivar Evaluation



Isolation Heading Date Trials



# Tetraploid Technology

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 impact of tasks, which contribute to the carbon footprint 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 percent 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.



Rooting capability of Tetraploid Perennial Ryegrass

*Note: A leaflet describing in depth the tetraploid technology is available on request*



Grateful thanks to Howard Wood BSc, of Landscape & Environmental Services Limited for his contribution to this study and document.

## Summary

The summer of 2018 was a clear indicator, if one were needed, of how changes in climatic conditions 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. Seemingly insignificant Individual choices can collectively make a meaningful contribution overall.

Choosing Rigby Taylor C4G amenity grass seed mixtures for sports and landscape applications are small but sure steps in the right direction.



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## Rigby Taylor and Top Green provide innovative, quality mixtures for all Sports Turf and Landscape surfaces.



**TOP  
GREEN**

**RT**  
rigby taylor

Rigby Taylor Limited

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