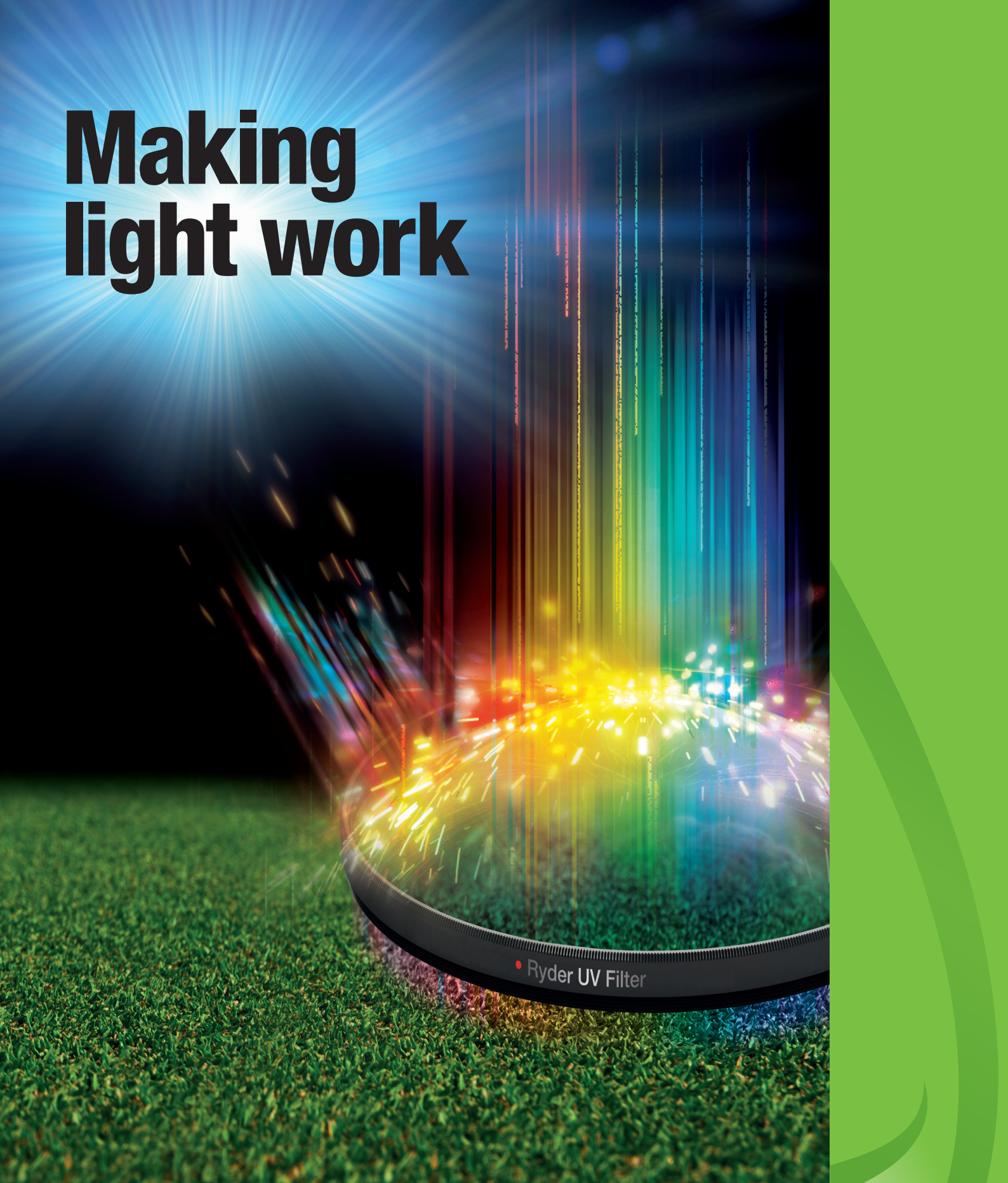


# Making light work



syngenta®

## INTRODUCTION TO RYDER TURF PIGMENT

**RYDER provides an incredible visual effect - producing a deep, desirable green colour - with a shade and intensity you can manage to suit your course and conditions.**



**And, at the same time, RYDER enables you to manage light - to make it work more efficiently for your turf plants.**

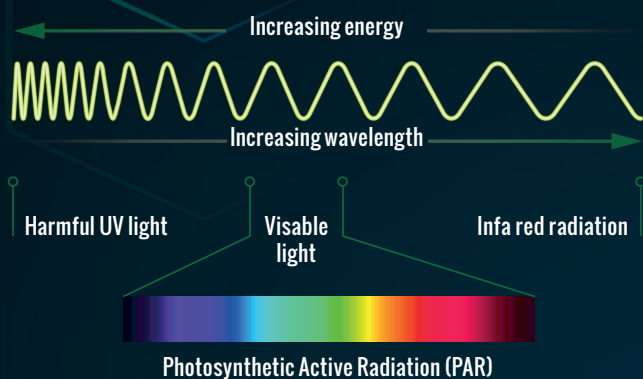
Not all energy emitted by the sun is useful for turfgrass growth. In fact, some of this energy can be actually harmful to the plant - effectively causing damaging sunburn to plant cells.

RYDER is a highly concentrated and stable green pigment designed for use on managed turf to improve its appearance and to help protect against UV radiation and high light intensities.

## Light waves

Particles of light contain energy that drive the photosynthetic process. This Photosynthetic Active Radiation (PAR), includes the “colours” of the light spectrum: violet, blue, green, yellow, orange, and red. Blue and red light are most efficiently utilised by chlorophyll to support plant growth and development.

Not all light is useful for photosynthesis...some can be harmful

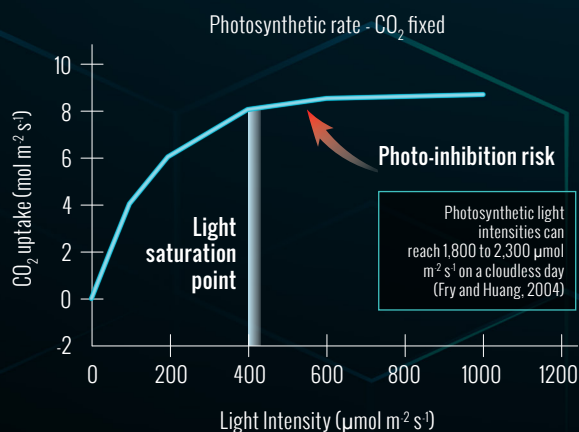


However, plants can only absorb so much light. High levels of light can be stressful to plants and result in photo-inhibition - decreasing the plant's photosynthetic capability.

UV rays and excessive light causes the formulation of free radicals in the plant. Free radicals are highly reactive molecules that attack and destroy membranes and plant proteins, including chlorophyll, which leads to inhibition of photosynthesis and growth (photoinhibition).

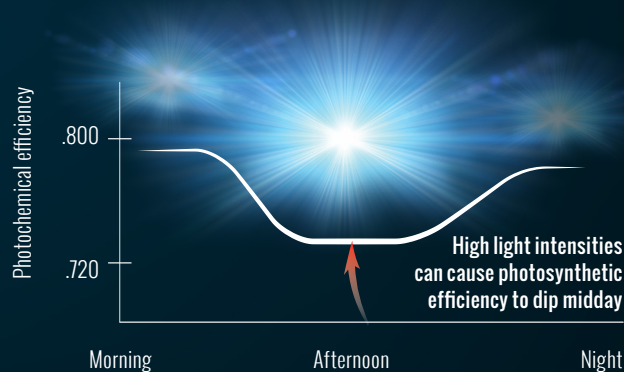
The amount of light plants can actually use varies from species to species and individual situations.

Plants can have too much light



Light response curves show that cool season grasses reach light saturation point (the point where additional light ceases to increase the photosynthetic rate any further) at 300 to 500 micromoles. In summer, light intensities typically reach 2000 micromoles (4x greater than the saturation point) and even on a cloudy day it can be over 1500 micromoles.

Photochemical efficiency dips in mid day light conditions



The susceptibility of turf to light stress is severely intensified when under heat stress, drought stress or cold stress. Under these conditions the saturation point can drop to 100 micromoles. So even in autumn or spring the turf can suffer light stress. Light intensities can reach 1000 micromoles on a sunny winter day (10x the light saturation point).

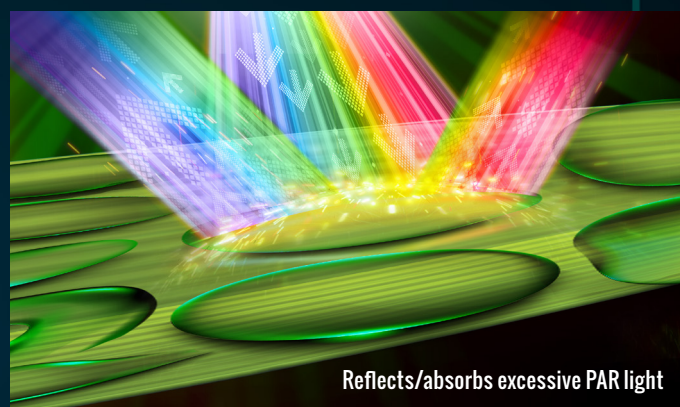
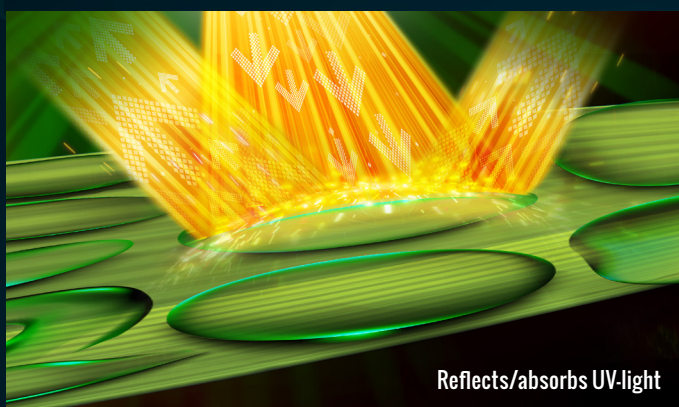
## How does RYDER work?

Plants produce natural compounds to reflect, scatter and screen from radiation damage, including carotenoids, anthocyanins, flavonoids, and cuticle waxes.

Using the latest generation of pigment technology, at a high 70% concentration, RYDER can effectively mimic plant pigments and deliver protection against harmful UV radiation and high light intensities

The intensity of colour can be selected through adjustments to application rate, frequency and integrated fertiliser programmes.

RYDER helps protect against harmful UV light and excessive light



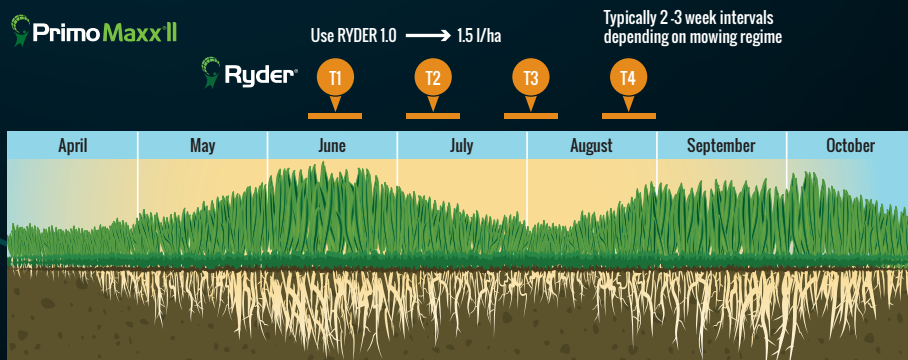
### Natural defence

Plants naturally produce more defensive mechanisms in the face of high light intensity. Purpling of leaves can be caused by enhanced anthocyanin production. Anthocyanin is a natural turf pigment.

## RYDER Programme timing

RYDER would typically be applied prior to a predicted period of stress but can be applied throughout the year if required used in combination with Primo Maxx II.

RYDER summer programme



- Over the summer, RYDER will help provide protection against high light intensities and UV light and stay looking green where desired.
- Through autumn, RYDER maintains turf appearance and colour for longer. RYDER application following sand topdressing or over seeding can instantly recover appearance.



## Dye difference

RYDER is a high-concentration turf-specific pigment. Unlike existing water soluble turf dyes, RYDER is a formulated pigment that, once dry on the leaf, it is not washed off by rain or irrigation and is stable in light. It stays in place for longer that retains its colour and effects.

## Application aid

The instant colour provided by RYDER can act as a spray pattern indicator in itself, especially at higher rates or on turf inherently paler at the time of application.

For even coverage always apply using Syngenta XC Nozzles, operated at 50 cm nozzle tip height and at a water volume of 250 - 500 litres/ha.

Two sprays at half rate, applied in different directions, can achieve better coverage on turf leaves managed at higher heights of cut.



## Application rates

### Turf mowing height under 12mm

*eg: greens, tees, approaches, bowling greens: cricket squares*

Apply at a rate of 0.75 to 1.5 l/ha in a water volume of 250-500 litres per hectare. Use higher rates for deeper green colour and greater protection against UV light.

Used in conjunction with a Primo Maxx II programme, reduced mowing will increase longevity in growing periods.

### Turf mowing height over 12mm

*eg: fairways: sports fields: cricket outfield*

Apply at a rate of 1.0 to 2.0 l/ha in a water volume of 250-500 litres per hectare. Use higher rates for deeper green colour, higher heights of cut and greater protection against UV light.

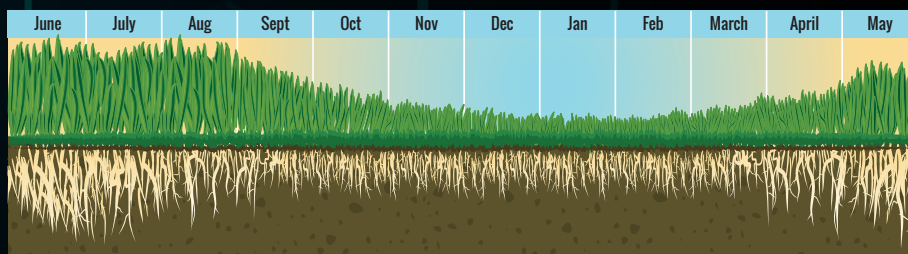
## RYDER Autumn / Winter programme



Tank mix with autumn fungicide programme

Use RYDER 1.0 → 1.5 l/ha

RYDER 1.0 l/ha



- Over winter and early spring the colour gets turf looking great and ready for play. The enhanced colour of treated turf can increase canopy temperature and initiate spring recovery. In April light intensity can be the same as August. An early start to treatment programmes will build up prolonged results for turf.

## RYDER - Making light work

- » Great lasting colour - that can be tailored to your turf demands.
- » Protection from harmful UV radiation and high light intensities.
- » Rainfast in 1 hour.

### Read what turf and amenity professionals are saying about Ryder:



*Ryder instantly improves visual appearance. Excellent in winter months.*

**Steven Knaggs**

Dumfries & County golf club, Dumfries

*Great to improve colour and appearance without nutrition through winter.*

**Darron Mather**

Pleasington Golf Club, Lancashire

*Ryder gave a good colour and appearance.*

**Craig Boath**

Carnoustie Golf Links, Dundee



*Very good for colour enhancement.*

**Andy Sheehan**

Milltown Golf Club, Dublin

*Great product to use, instant impact.*

**Wayne Ganning**

Moor Hall GC, West Midlands

*With regular use Ryder gives a long-lasting, positive colour to greens and tees.*

**Martin Lehane**

Mount Juliet Golf Club, Kilkenny

*Ryder is a good product.*

**Scott Hawkins**

Somerset County Cricket Club



*Good colour and recovery aid.*

**Adam King**

Radley College, Oxfordshire



*Nice green up with no extra N inputs.*

**Andy Ross**

Richings Park Golf Club, Buckinghamshire

*Nice green up.*

**Nick Paris**

Royal Wimbledon Golf Club, Surrey



*Excellent tank mix that seemed to get better results with my fungicide applications.*

**Stevie McAdams**

Course Manager, Hessele Golf Club, East Yorkshire

*Does an effective job, especially in winter.*

**Andy Whyman**

Chester Golf Club, Cheshire

*Excellent green up. Great as spray marker.*

**Jody Wilson**

Mid-Herts Golf Club, Hertfordshire

*Ryder is a fantastic product. Great to use before a big competition or event. Very useful during periods of high temperatures and prolonged sunlight.*

**Dan Harding**

Old Thorns Golf Club, Hampshire

