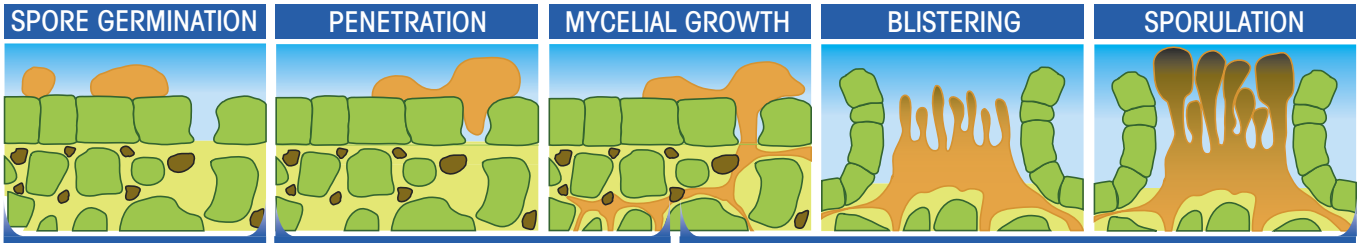
Fungicide Application Timing

Fungicides are generally classified into specific groups and should ideally be applied when conditions are conducive to disease attack, or at the first sign of a disease outbreak.

Different groups of fungicides have different modes of action. Some are multi-site, others are single site inhibitors. Some work better when the grass is actively growing whilst others perform better under cold conditions.

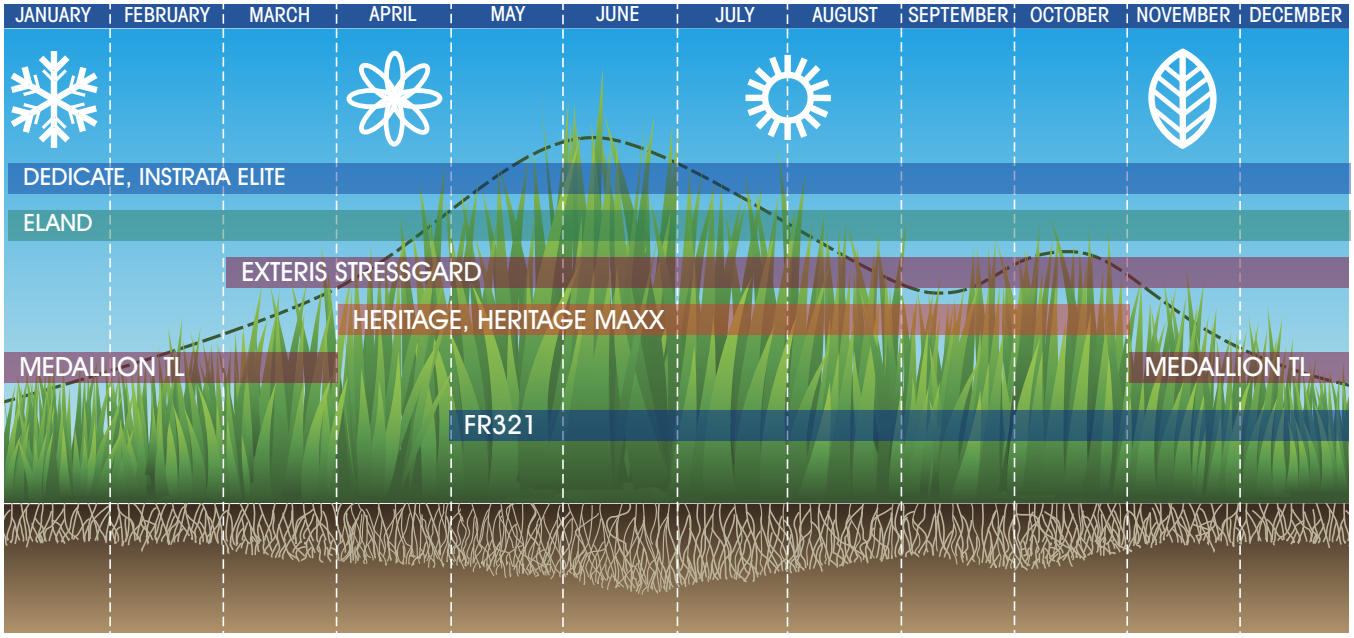
Curative Action: Opposite to prevention is to cure an infection after it has already occurred. Here, spores will have already entered the leaf tissue and are actively producing mycelial growth inside the leaf. It is vital for effective control that application of a curative fungicide is applied immediately any sign of disease is observed. Most fungicides with curative action will also protect plants that have not been infected.



PREVENTATIVE/ PROTECTANT ACTION	CURATIVE ACTION	ERADICANT ACTION
Prevents/protects against spore germination and infection on leaf surface	Prevents early disease development inside the plant	Halts pathogen development when disease symptoms are visible and prevents further spread
Apply fungicide prior to high disease risk periods before infection occurs	Treat during periods of high disease pressure when infection may have occurred but symptoms not yet visible	Apply fungicide treatments immediately at first visible signs of disease infection

Preventative Action: When weather/climatic conditions are ideal for disease development, it is highly likely that disease spores will be active on the leaf surface. However, these spores may not have penetrated (infected) the plant. Applying a fungicide as a preventative application before infection occurs will ensure that the plant is protected. The difficulty however is predicting when infection may occur and here local knowledge, consulting past records and attention to weather forecasts is essential.

Tank Mixing – More recently it has been shown that combining as a tank mix, two or more products from different chemical groups and with differing modes of action can improve the overall effect and reduce the risk of disease resistance. Rigby Taylor provide a range of disease control strategies. See your area representative for details.



Turf Disease Identification

Fusarium Patch

(Microdochium nivale)

Symptoms

The disease first shows as small patches of yellowish, dying grass that later turn brown, increase in size and coalesce. In moist, humid weather the patches may become covered with a white or faintly pink cotton like fungal growth, which mats the dying vegetation together. The disease is encouraged by lack of aeration and excessive use of Nitrogenous fertilisers, especially when applied after August.

Conditions favouring development

- ❇ Thrives during warm, wet weather 12-19°C
- ❇ Can occur during summer months
- ❇ Symptoms often masked by fast growth
- ❇ Spread under moist conditions and slow growth
- ❇ Transmitted by wind-borne asexual spores
- ❇ Lies dormant on dead leaf matter
- ❇ Can be carried on tyres and shoes

High risk period

J F M A M J J A S O N D

Fusarium Patch controlled by

- Dedicate
- Instrata Elite
- Medallion TL
- Heritage
- Exteris Stressgard
- Eland

Anthracnose

(Colletotrichum cereale)

Symptoms

Anthracnose occurs in two forms, basal rot and foliar blight, which can develop at different times of year according to weather conditions. Basal rot symptoms are yellowing leaves, with the youngest leaf brick-red in colour and black rot appearing at the base of the leaves. With foliar blight, symptoms appear as irregular, yellow or brown patches of turf, which turn tan and die. It can be mistaken for drought, however the symptoms worsen with watering and numerous small black fruiting bodies covered with black spines can be seen at the rotting base of the plant.

Conditions favouring development

- ❇ Presence of Poa annua
- ❇ Basal rot appears under wet/cool conditions
- ❇ Foliar blight occurs under higher summer temperatures
- ❇ More likely to occur when the turf under stress
  - Low fertility (particularly Nitrogen)
  - Soil compaction,
  - Drought
  - Excessively low mowing heights
- ❇ Insect/nematode activity can encourage development

High risk period

J F M A M J J A S O N D

Anthracnose controlled by

- Eland
- Exteris Stressgard
- Dedicate
- Medallion
- Heritage
- FR321

Red Thread

(Laetisaria fuciformis)

Symptoms

Patches of affected grass with a reddish tinge at first, later becoming light brown or almost bleached in appearance. Patches vary in size from 7.5cm to 25cm in diameter but can be much larger.Two types of fungal growth may be seen on the patches, particularly under wet or humid conditions. The first takes the form of small, pink, cottony flocks, and can be confused with growth of the fungus causing Snow Mould. The second is specific to red thread – pinkish-red, gelatinous, thread-like structures (stromata), 1-2mm in length, are produced on the leaves and may bind them together. When dry, the pink strands are brittle and resemble red threads. These shatter and spread the disease. Dry fragments can survive for up to two years.

Conditions favouring development

- ❇ Attacks Fescue and Lolium perenne species
- ❇ Favours mild temperatures/damp surface
- ❇ Grass susceptible with low fertility
- ❇ Slow growing turfgrass

High risk period

J F M A M J J A S O N D

Red Thread controlled by

- Eland
- Heritage
- Dedicate

Dollar Spot

(Sclerotinia homoeocarpa)

Symptoms

Dollar Spot is most commonly found on closely mowed turfgrasses. The disease appears as round, brown to straw-colored and somewhat sunken spots, often seen in clusters. Dollar Spot is readily distinguished from other turf disease by light-tan lesions with a reddish-brown border on the leaf blades of live plants near the edge of the affected area. Early in the day or in periods of extended dew, cobweb-like mycelium of the fungus can be seen growing on affected areas. During early stages of the disease, affected plants may appear water-soaked and wilted, but spots quickly fade to a characteristic straw colour.

Conditions favouring development

- Thrives under periods of high humidity 15-30
- Grass susceptible under heavy dew formation
- High humidity during day, cool at nights
- Fescue and Poa annua are at high risk
- Disease requires high moisture in leaf canopy

High risk period

J F M A **M** **J** **J** **A** S O N D

Dollar Spot controlled by

Instrata Elite
Heritage
Exteris Stressgard
Dedicate
Eland

Brown Patch

(Rhizoctonia solani)

Symptoms

Turfgrasses that are wet for extended periods and are closely mowed will produce a distinctive gray-purplish bordered ring that is up to 50cm in diameter. On taller cut grasses that are not wet for extended periods will begin to produce patches that can be several feet in diameter and may have a 'frogeye' appearance. White mycelium can be found on dew-covered turf in the early part of the morning. On a closer look at the leaf blades you may be able to see tan to brown small, irregular shaped lesions.

Conditions favouring development

- Thrives in temperatures range 70°F to 90°F
- Can survive freezing conditions
- It is most when temperatures keep above 68°F
- Attacks during extended periods of high humidity
- Thrives on lush and succulent growth
- Over winters in grass tissue or Sclerotia bodies

High risk period

J F M A M **J** **J** **A** S O N D

Brown Patch controlled by

Eland
Instrata Elite
Heritage

Rust

(Puccina spp.)

Symptoms

Rust appears as an orange or yellowish-orange powder (spores) on grass leaf blades, especially in late summer to early autumn when the weather is dry. Overall, the turf may assume a yellow, red, or brown appearance. Close examination will reveal the pustules, which easily rub off on your hand.

Conditions favouring development

- Low fertility (in particular Nitrogen)
- Cool nights with heavy dew
- Frequent light rainfall increases risk
- Cloud and humidity followed by hot, sunny weather
- Spreads via air, water, shoes, equipment
- Weakens grass making it more susceptible to other problems

High risk period

J F M **A** **M** **J** **J** **A** **S** **O** N D

Rust controlled by

Heritage
Dedicate

Grey Snow Mould

(Typhula spp.)

Symptoms

Consist of roughly circular patches (at least 3 to 12 inches) of dead and matted grass blades. In severe cases, these patches coalesce and may not be recognizable as individual circles. A useful identifying characteristic of Grey Snow Mould is the presence of tiny brown to black mycelial masses (sclerotia) on the blades and in the leaf sheaths of infected plants. These survival structures vary in size and color, becoming smaller and darker as they dry.

Conditions favouring development

- Active are active at temperatures just above freezing
- Favours most conditions for development
- Thrives under a blanket of fresh snow or fallen leaves.
- Remains inactive during the warm months when other
- Spores can survive in thatch and on Scerotinia bodies

High risk period

J	F	M	A	M	J	J	A	S	O	N	D
■	■										■

Grey Snow Mould controlled by

Eland
Heritage

Leaf Spot

(Drechslera poae)

Symptoms

Leaf spots on turfgrass leaf blades begin as small red to purplish ovals that later develop tan centers of dead tissue with darker borders ('eye spots'). The fungi that cause leaf spots directly penetrate leaf sheaths and blades at random or enter via mowing wounds which commonly leads to a tip blight. When turfgrass is succulent from recent Nitrogen fertilization and there is abundant moisture on the leaf blades, numerous leaf spot infections per blade can occur. The leaf spots may then coalesce and cause extensive blighting. The fungus may even invade the crowns and roots, leaving the plants weakened and rotted. This severe stage is called 'melting-out'. Large areas of dead or badly weakened turfgrass may result.

Conditions favouring development

- Active at mild, warm temperatures around 20°C
- Attacks moist leaf blades under high humidity
- High levels of fertility
- Lower than recommended mowing heights
- Excessive thatch

High risk period

J	F	M	A	M	J	J	A	S	O	N	D
		■	■	■			■	■	■		

Leaf Spot controlled by

Eland
Exteris Stressgard
Dedicate
Medallion TL
FR 321

Fairy Rings

(Basidiomycetes)

Symptoms

There are 3 types of Fairy Ring.
Type 1 Typically appear as a ring of dead or stressed turf, bordered on both inner and outer edges by a band of stimulated grass growth. New rings can appear just as green 'patches'. Type 2 Stimulated grass growths are seen normally without fruiting bodies. It is rare that excessive damage is caused to the turf.

Type 3 Have no distinct affect on turf except when the fruiting bodies are present, forming rings of mushrooms or puffballs.

Conditions favouring development

- High thatch levels in fine turf
- Soil high in organic matter
- Colonises thatch at the turf base
- Starts with a germinating spores or a strand of mycelium
- Rings of stimulated growth are the result of soil Nitrogen release

High risk period

J	F	M	A	M	J	J	A	S	O	N	D
			■	■	■	■	■	■	■		

Fairy Rings controlled by

Heritage
Eland

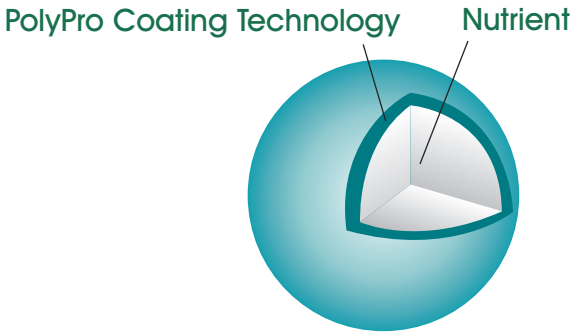
Nutrition Delivery Technology

It's not the time a fertilizer is applied that's important it's when the nutrition becomes available to the plant. A range of options is now available to maximise fertilizer performance in line with the nutrition demands of the plant.

PCU

Encapsulated granular technology

A patented, polymer membrane releases nutrients via temperature controlled difdedicate.



Nitrogen is released gradually throughout the plant's growth cycle, resulting in precise, and predictable feeding of the rootzone that lasts for months. The key to this consistent, gradual nutrient release is the Reactive Layers Coating™ polymer membrane surounding each granule not affected by moisture. Nutrient release is only activated by temperature and not by microbial activity or excessive moisture.

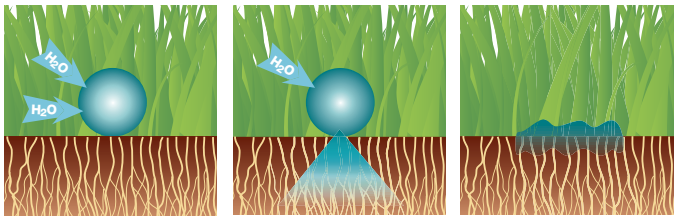
There are 3 phases in this release process:-

1. Absorption Phase (first week). No immediate release occurs during this stage. Until water, which is absorbed into the polymer coating, reaches the encapsulated urea to initiate dissolution within, there can be no urea difdedicate release.

2. Steady-State Release Phase. Once release by difdedicate begins, the release rate is constant or steady-state until all encapsulated urea is dissolved. During this stage there are both un-dissolved urea solids and urea solution at maximum concentration encapsulated by the polymer coating. This maximum solution concentration causes a constant osmotic pressure and a steady-state release rate. Complete dissolution of the encapsulated urea occurs when about 50% of the urea has been released, since urea has a maximum solution concentration of 50% at ambient temperatures.

3. Declining Release Phase. Once all encapsulated urea solids are dissolved and only urea solution remains, continued absorption of water and difdedicate release of urea continuously reduces the solution concentration of the encapsulated urea. This decreasing concentration results in a declining osmotic pressure, which causes a continuous slowing (or declining) of the release rate. Generally, the time for release of the last half of urea will be about twice the time for release of the first half.

After complete release of nutrients, the polymer coating microbially decomposes into naturally occurring soil



Within a week of application, the polymer coating allows soil moisture in, which activates encapsulated nutients but doesn't release them.

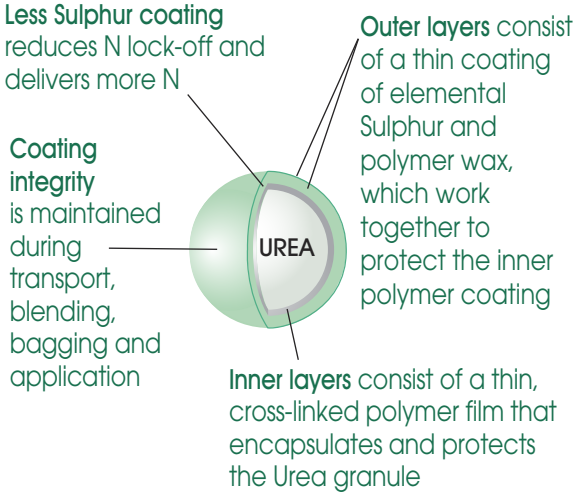
Over the next several months, the membrane slowly releases dissolved nutrients through difdedicate, only when triggered by soil temperature.

After complete release of nutrients, the polymer coating microbially decomposes into naturally occurring soil elements.

PSCU

Advanced hybrid release, dual coating technology

The granule has a thin outer coating of ploymer wax and Sulphur, with an inner polymer coating, giving a hybrid difdedicate/catastrophic release, which out-performs other PCSU products on the market.



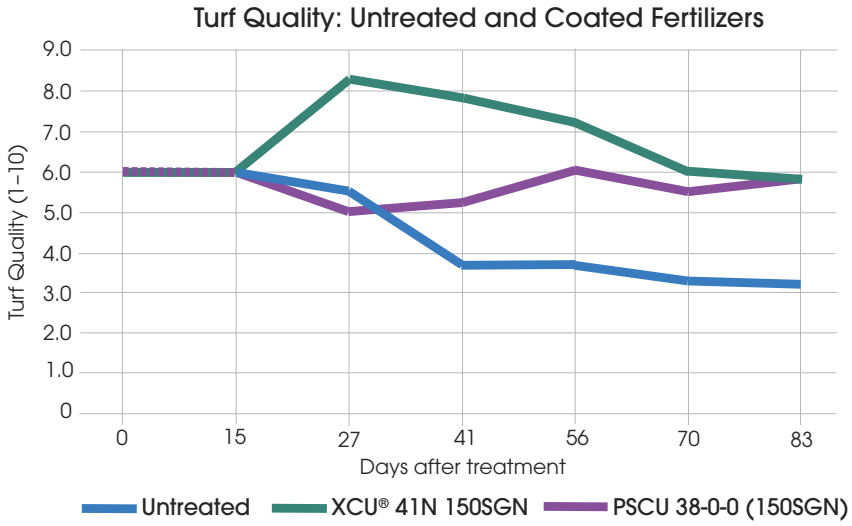
- Unique, durable coating provides gradual consistent N release when needed to optimize nutrient uptake by the plant
- Dual-coated technology provides up to 12 weeks of plant response
- Fewer applications can reduce overall fertilizer expense, fuel costs and equipment upkeep; allows for optimisation of labour.
- Highly flowable for ease of handling and consistent application
- Environmentally responsible with low potential for nutrient leaching, denitrification, run-off or volatilisation.

Soil moisture penetrates the Sulphur and polymer coatings

Nitrogen begins to dissolve creating pressure within the granule

With previous technology SCU's this pressure cracked the coating, immediately releasing N (catastrophic release). The inner polymer coating of XCU® fertilizer results in a hybrid of difdedicate-based release and catastrophic release, resulting in a more consistent release profile.

After N release, the Sulphur eventually breaks down into the soil where it may be taken up by the plant



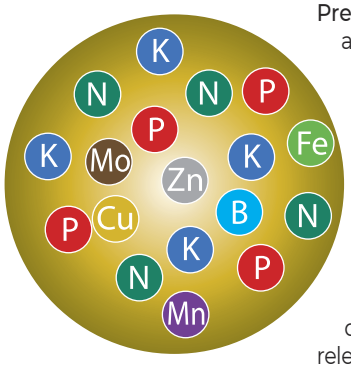
"Application of XCU resulted in significantly greater turf quality compared to the PSCU product. Improved turf quality was observed between 27-65 days after application"

Dr Christian Spring

STRI

Methylene Urea

Extended N release in mini- and micro-granular form



Premier HG, Microfine, Microlite and **Delta SR** contain MU plus a combination of other essential nutrients.

The patented Methylene Urea used by Rigby Taylor, has short and medium length polymer chains that are specially designed to achieve the required results, and release pattern. The length of chain determines the longevity of release. Rigby Taylor uses chain lengths that will give 10-24 weeks, depending on the product range.

The specially designed polymer chains are made up of:-

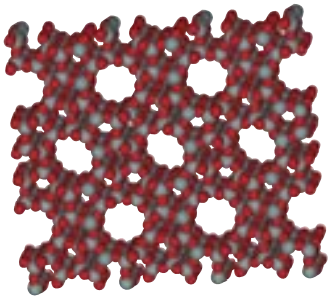
- Free Urea for rapidly available N
- Cold water-soluble Nitrogen (CWSN) which gives available N over a few weeks
- Hot water-soluble Nitrogen (HWSN), which releases the N over 8-16 weeks
- Hot water-insoluble Nitrogen (HWIN), which releases the N over 16-24 weeks

The Methylene Urea also promotes strong root growth and a balanced, healthier top growth. It also improves the natural fertility of the soil increasing and sustaining the population of beneficial organisms because it is a source of organic Carbon and Nitrogen. The MU will provide a uniform, sustained release even during hot weather or heavy rain.

The Methylene Urea also has a very low salt index, one of the lowest available, meaning a very low scorch potential. Methylene Urea is also contained in Microflow CXS liquid formulations.

ZeoLite

Provides a natural affinity with N & K in quality fertilizers



Key addition to the range of **MicroIlte** and **Microlite Activ8** formulations.

Clinoptilolite (Zeolite) is a naturally occurring mineral incorporated in the **MicroLite** range. It has a natural affinity to Nitrogen and Potassium and these nutrients are absorbed into the Clinoptilolite grid and then released as and when demanded by the plant. Clinoptilolite will also hold up to 55% of ots weight in moisture, which is again released as the plant demands.

Nutrient Availability & Selection

In a turf management environment, nutrients added to the soil/plant are normally supplied in the form of fertilizer, either as dry applications such as powder or granules or spray applied as liquids or water-soluble formulations.

Turf fertilizers are classified as those that are essential (macro) and applied regularly and those that are required and applied in lesser quantities (micro) but still important for healthy plant growth. However, all nutrients are important and it is not the quantity that is applied but their availability to the plant.

Nutrient deficiency

Turf quality is controlled not by the total amount of nutrients available to the plant, but by the nutrient in limited supply. A simple 'law of the minimum' is illustrated here by Liebigs Barrel.

Just as the capacity of a barrel with staves of unequal length, is limited by the shortest stave (in this example Phosphate is the limiting factor), so a plant's growth is limited by the nutrient in shortest supply.

Understanding how to recognize nutrient deficiencies will allow corrective action to be taken to lessen the effect and prevent a similar situation arising in the future.

A range of factors influence the availability of nutrients. Some will be under your control, others will not.

Nutrients likely to be deficient under certain soil conditions					
Cold Soils	N	P	S	Fe	Zn
Saturated Soils	N	P	K	Fe	Zn
High pH	Cu	Fe	Mn	Zn	
Low pH	S	Ca	Mg	Mo	
Compacted Soils	P	K	Mg		
Dry Soils	P	K	S	B	
High Organic Matter	K	Cu	Mn		
Sandy Soils	S	Mg	K	B	Mn
High Calcium	P	Fe			
Low Organic Matter	S	K	P	B	Zn
High Magnesium	Ca				
Low Magnesium	Ca	Mg			

Classification of nutrients

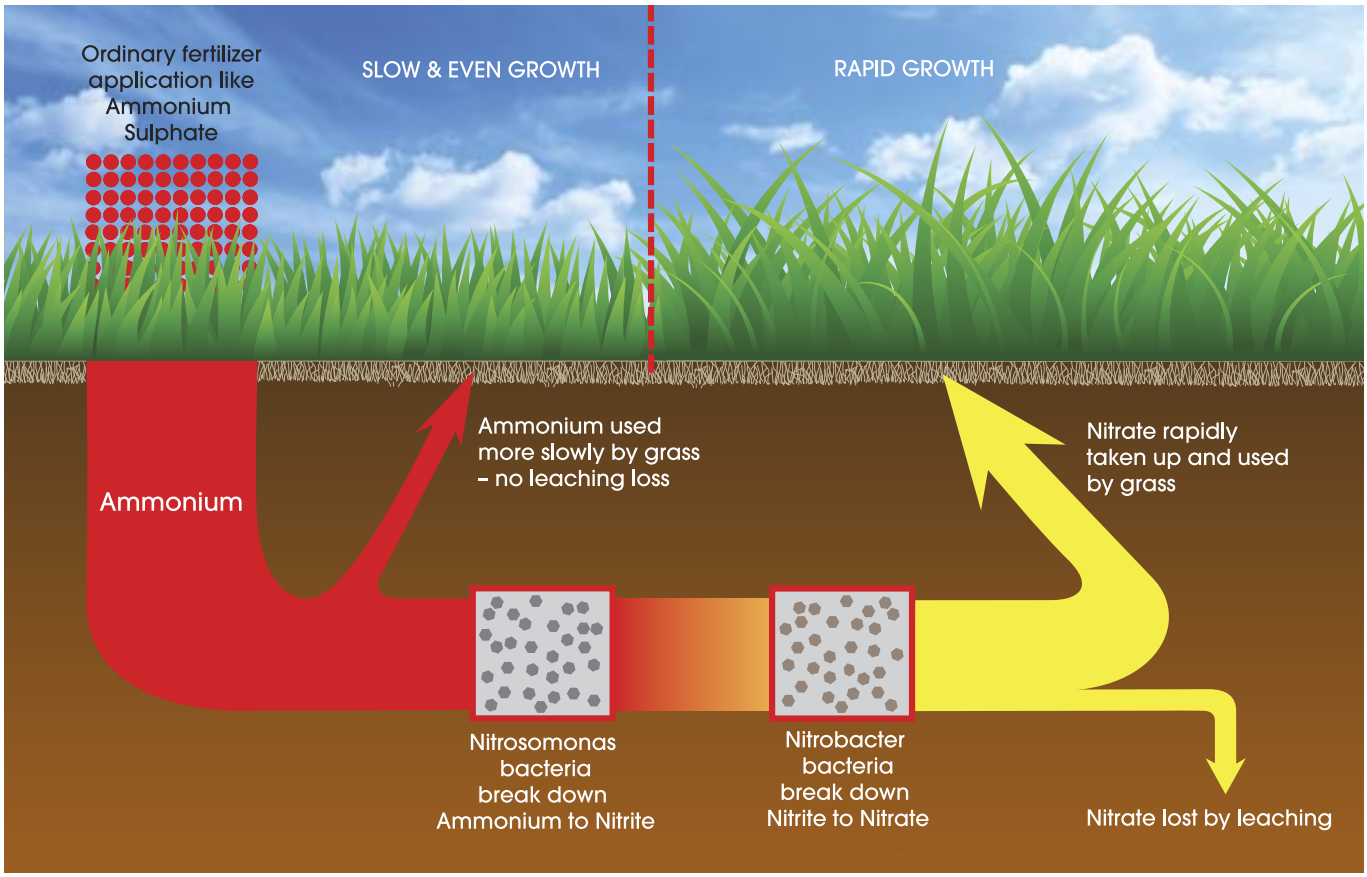
MACRONUTRIENTS	PLANT REQUIREMENTS
Nitrogen (N)	Shoot-root growth, density, colour, disease resistance, and stress tolerance
Phosphate (P)	Seedling development and root growth
Potash (K)	Improving drought tolerance by water regulation. Cold hardiness and improved disease resistance
Calcium (Ca)	Cell development and division
Magnesium (Mg)	Chlorophyll production. Transportation of phosphorous around the plant
Sulphur (S)	Aids in protein synthesis, helps in the utilization of nitrogen. Chlorophyll production

MICRONUTRIENTS (TRACE)	
Boron (B)	Cell wall formation. The translocation of sugar and carbohydrates
Copper (Cu)	Cell wall structure. Carbohydrate metabolism
Iron (Fe)	Chlorophyll development, colour enhancement and hardening off
Manganese (Mn)	Chlorophyll synthesis
Molybdenum (Mo)	The conversion of nitrates into amino acids
Zinc (Zn)	Root development and seed establishment

The majority of nutrients are taken up by the roots via the soil though some can also be absorbed through the leaf when applied as a foliar spray.There are other elements such as Carbon, Hydrogen and Oxygen can be both through the aerial parts of the plant and from soil moisture via the roots.

Nutrient release timing of Nitrogen can be rapid or slow depending on the form used. The two forms are Nitrogen Ammonium (NH_4^+) and Nitrate (NH_3^-).

Applying Nitrate Nitrogen will result in it being quickly taken up by the plant and producing rapid grass growth. It can however be an excellent tool where the plant needs a rapid boost and enhanced colour. Ammonium Nitrogen is also taken in by the plant but utilized less quickly, resulting in slower growth. It is also held longer in the soil, which reduces the risk of loss through rapid leaching.



Nitrogen Uptake

Nitrogen occurs in various forms, organic, ammoniacal and ureic. These have to go through various processes before they are available to the plant.

Organic: Organic sources have to go through Mineralization. This process transforms the organic source into an inorganic source (ammonium).

The first part of the process is Aminization, which is the decomposition of the organic N by bacteria and fungi, to produce Amino Nitrogen, which is then microbially converted in to ammonia.

Organic N *+Aminization* = Amino Acids *+Ammonification* = Ammonium N

Ammoniacal: Ammoniacal sources have to go through Nitrification, when the Ammonium is converted in to Nitrate.

The first process involve Nitrosmonas (bacteria), which oxidize the Ammonia in to Nitrite. Nitrobacter (bacteria) then oxidize the Nitrite in to Nitrate. These reactions occur very closely to prevent a build up of Nitrite, as it is toxic to the plant.

Ammonium *+Nitrosomonas* = Nitrite *+ Nitrobacter* = Nitrate

Ureic: Ureic nitrogen is hydrolized into ammonia (and carbon dioxide) by an enzyme called Urease.

Urea *+Urease* = Ammonia

All the above processes can be affected by moisture, temperature, microbial activity, pH and aeration.

Applying Nutrients

Getting fertilizer to where it is needed can be achieved in different ways; dry (granules/powders) applied alone or from a spray (liquid/water soluble).

In the main however, there is no hard and fast rule as to what is best. The application selection method will often depend on practicalities, climatic conditions and personal preference. In many cases it will be that 'one size does not fit all' and a combination of application methods will be selected.

The most successful fertilizer programme will be one that provides a consistent supply of plant nutrients when demanded, without causing a surge (flush) of vegetative growth or cause a 'lock up' of other nutrients availability.

The Rigby Taylor range offers the widest choice of fertilizer options.

Controlled release
Microlite, PolyPro, ConVert, Premier HG, Microfine, Microflow

Conventional release
MicroLite Activ8,
TE-Bag, Fine Turf, Outfield

Organic/Organic content
Microfine Organic, Apex, Delta

Liquid
MicroFlow

Water soluble
Microsol

Which to apply and why?

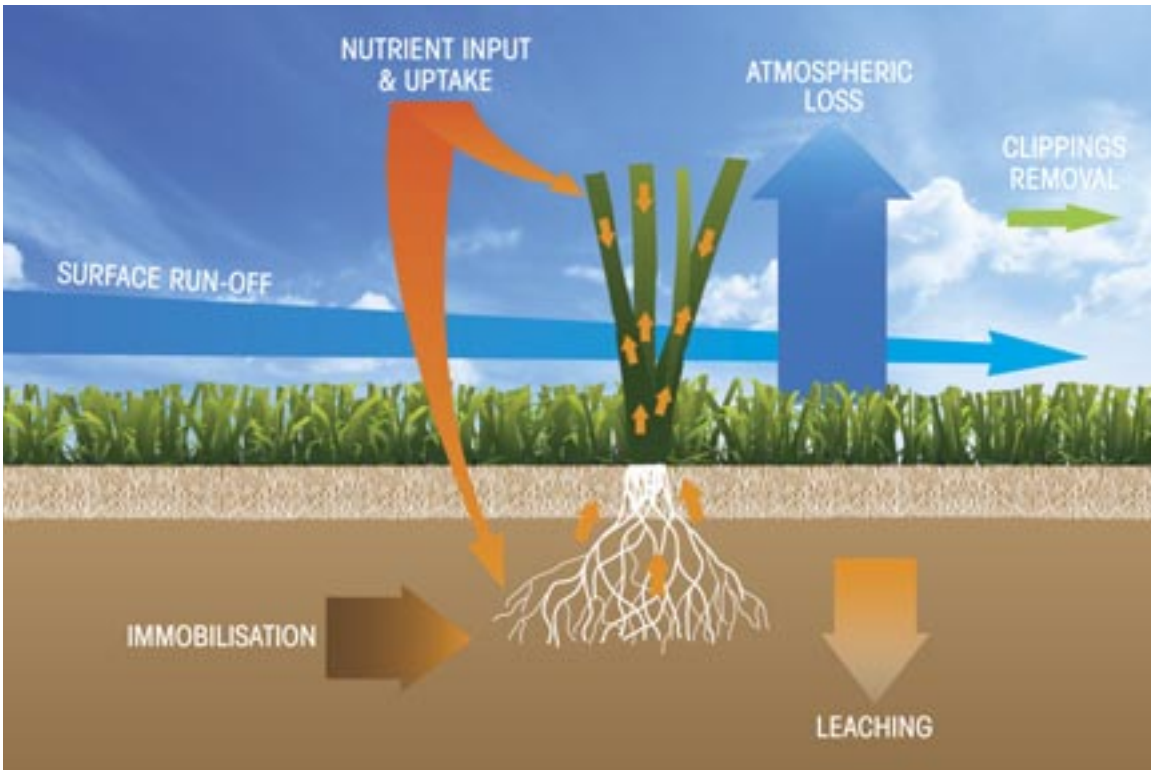
Different fertilizers have different modes of action and it is important to understand some of the key factors that influence the selection making process.

Where a quick response is required, a fertilizer with the ability to allow rapid availability of nutrients to the plant will be a key factor in the selection making process.

There are products, including liquids, water-solubles and conventional dry formulations, that will provide a rapid growth response in the turf plant and enhanced colour. The downsides to applying such products are two fold.

1. Excessive nutrient loss through the leaves could quickly occur as, due to the creation of increased vegetative growth, mowing regimes may be increased leading to increased clipping removal, and
2. Rapid leaching of nutrients, surface run-off, volatilization

Slow release, controlled/phased release and organic based fertilizers release their nutrients over a period of time (up to 24 weeks) and offer a consistent and reliable delivery of nutrients. Such control over the nutrient release will minimize nutrient loss and maximize nutrient efficiency.

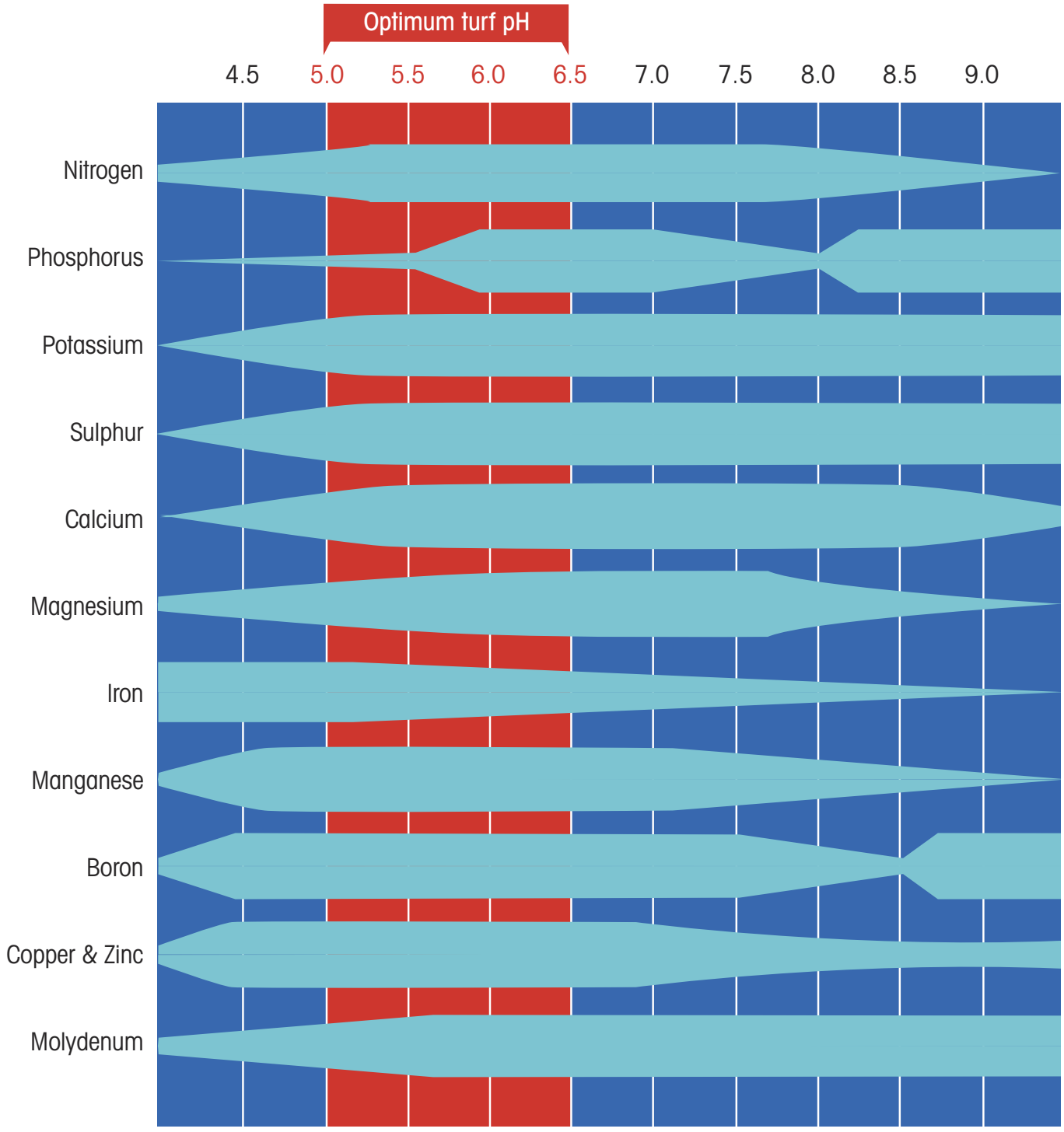


pH Influence on Nutrient Availability

The letters pH stand for 'Potential Hydrogen' and represents the measure of Hydrogen ions in the soil.

The availability of soil nutrients is affected to a greater or lesser degree by the pH of the soil. The chart below indicates the effect that levels of pH can have on the availability of nutrients to the plant.

Using the chart, in conjunction with the results of soil analysis, can be used in deciding the fertilizer programme to adopt.



Spray Nozzle Selection

Rigby Taylor is the exclusive appointed distributor for the leading range of Billericay Air Bubble Jets for the amenity industry. These jets are the most effective in reducing spray drift, chemcial waste and are an environmentally responsible preference for spray operators.

WHY AIR BUBBLE JETS

- Maximum spray contact, minimum spray drift – reduces spray drift by 75%*
- Less affected by wind – provides more spraying day opportunities
- Less than 2% driftable droplets (100 microns) – compared to 20% conventional nozzles
- LERAP PPP award – B category chemicals sprayed within 1m of a water course

Nozzle	Bar	Flow L/min	3 KPH	4 KPH	5 KPH	6 KPH	7 KPH	8 KPH	9 KPH	10 KPH
0.1 Orange	2.0	0.33	132	99	79	66	57	50	44	40
	3.0	0.40	160	120	96	80	69	60	53	48
	4.0	0.46	184	138	110	92	79	69	61	55
	5.0	0.52	208	156	125	104	89	78	69	62
0.15 Green	2.0	0.49	196	147	118	98	84	74	65	59
	3.0	0.60	240	180	144	120	103	90	80	72
	4.0	0.69	276	207	166	138	118	104	92	83
	5.0	0.77	308	231	185	154	132	116	103	92
0.2 Yellow ** At 2 bar	2.0	0.66	264	198	158	132	113	99	88	79
	3.0	0.80	320	240	192	160	137	120	107	96
	4.0	0.93	372	279	223	186	159	140	124	112
	5.0	1.04	416	312	250	208	178	156	139	125
0.25 Lilac *** At 2 bar	2.0	0.82	328	246	197	164	141	123	109	98
	3.0	1.00	400	300	240	200	171	150	133	120
	4.0	1.15	460	345	276	230	197	173	153	138
	5.0	1.30	520	390	312	260	223	195	173	156
0.3 Blue *** At 2 bar	2.0	0.98	392	294	235	196	168	187	131	118
	3.0	1.20	480	360	288	240	206	180	160	144
	4.0	1.39	556	417	334	278	238	209	185	167
	5.0	1.55	620	465	372	310	266	233	207	186
0.35 Brown Red *** At 2 bar	2.0	1.14	456	342	274	228	195	171	152	137
	3.0	1.40	560	420	336	280	240	210	187	168
	4.0	1.62	648	486	389	324	278	243	216	194
	5.0	1.81	724	543	434	362	310	272	241	217
0.4 Flame Red *** At 2 bar	2.0	1.31	524	393	314	262	225	197	175	157
	3.0	1.60	640	480	384	320	274	240	213	192
	4.0	1.85	740	555	444	370	317	278	247	222
	5.0	2.07	828	621	497	414	355	311	276	248
0.5 Brown *** At 2 bar	2.0	1.63	652	489	391	326	279	245	217	196
	3.0	2.00	800	600	480	400	343	300	267	240
	4.0	2.31	924	693	554	462	396	347	308	377
	5.0	2.58	1032	774	619	516	442	387	344	310
0.6 Grey *** At 2 bar	2.0	1.96	784	588	470	392	336	294	261	235
	3.0	2.40	960	720	576	480	411	360	320	288
	4.0	2.77	1108	831	665	554	475	416	369	332
	5.0	3.10	1240	930	744	620	531	465	413	372
0.8 White *** At 2 bar	2.0	2.61	1044	783	625	522	447	392	348	313
	3.0	3.20	1280	960	768	640	549	480	427	384
	4.0	3.70	1480	1110	888	740	634	555	493	444
	5.0	4.13	1652	1239	991	826	708	620	551	496

To select the correct nozzle for the intended operation use the simple steps below:

1. Read the label - This will provide information on rates of use/water volume and any application restrictions
2. Select the required water volume rate, i.e. litres per hectare (l/ha)
3. Select the chosen speed (kph)
4. Identify the nearest nozzle to the water volume required and this will show the required pressure (bar)'

For example:

Water volume require rate = 400 l/ha

Speed selected = 6 kph

Nearest nozzle match = Brown @ 3 bar pressure

ALWAYS fit the correct nozzle for the job required. Using the wrong nozzle may not only provide inferior coverage and control but will certainly be a costly waste of material.

Cromer Lawn Tennis Association

In addition to seeding the courts with Rigby Taylor's R9 ultra fine dwarf rye seed. Pre-coated with Germin-8T, Matt pinpoints a number of other Rigby Taylor's products as being ideal for his needs – and those of the courts – "including Premier HG slow-release granular and Fine Turf 6-0-18 fertilisers, SeaQuest liquid seaweed and Magnet Velocite liquid iron", in combination with the company's iGo line marker and its Impact XP paint "where every application consistently lasts for a week".

Matt Jordan
Head Groundsman

Useful Conversions

Grass Seed Quantity Guides (approximate)

How many 20kg bags of seed needed for certain sports pitches at specific application rates

Sports Facility	Dimension (metres)	Area (m^2)	No. of 20kg bags sown at: 20 gms per m^2	25 gms per m^2	35 gms per m^2
Soccer	100 x 64	6,400	6.4	8	11.2
Rugby	100 x 69	6,900	6.9	8.6	12.1
Hockey	91.4 x 55	5,027	5	6.3	8.8
Cricket Square	30 x 30 (Average)	900	0.9	1.1	1.5
Lawn Tennis	23.8 x 11	262	0.3	0.3	0.45
Bowls	40 x 40	1,600	1.6	2	2.8
Golf Green	Average	500	0.5	0.6	0.9
Golf Tees	Average	350	0.4	0.4	0.6
1 hectare		10,000	10	12.5	17.5

Mass per area

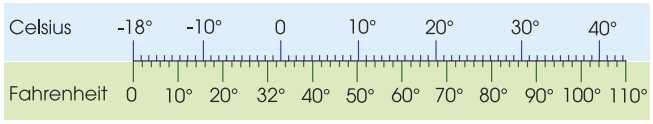
oz/sq.yd		g/sq.m
¼	=	8.5
½	=	17
1	=	34
2	=	68
3	=	102
4	=	136
5	=	170
6	=	204
7	=	238
9	=	306
10	=	340
15	=	510
20	=	680

Grass seed Sowing Rate Conversions

All Rigby Taylor seed sowing rates are expressed in grams per square metre. The following table can be used to convert these rates to units suited to larger areas or to imperial measurements.

Grams/m^2	8.0	15.0	25.0	35.0	50.0
Kilograms/100m^2	0.8	1.5	2.5	3.5	5.0
Kilograms/hectares	80.0	150.0	250.0	350.0	500.0
Kilograms/acre	30.0	60.0	100.0	140.0	200.0

Temperature



Degree Centigrade (°C) to Degree Fahrenheit (°F) multiply by 1.8 and add 32

Spraying speeds

Mass & Area

Weight	pounds	to kilogrammes	divide by	÷ 2.205	kilogrammes	to pounds	multiply by	× 2.205
	tons	to tonnes	multiply by	× 1.016	tonnes	to tons	divide by	÷ 1.016
	cwts	to kilogrammes	multiply by	× 50.794	kilogrammes	to cwts	divide by	÷ 50.794
Area	acres	to hectares	divide by	÷ 2.471	hectares	to acres	multiply by	× 2.471
	square yards	to square metres	multiply by	× 0.8361	square metres	to square yards	divide by	÷ 0.8361
Volume	pints	to litres	multiply by	× 0.568	litres	to pints	divide by	÷ 0.568
	litres	to gallons	divide by	÷ 4.546	gallons	to litres	multiply by	× 4.546
Weight / Area	tons/acre	to tonnes/hectare	multiply by	× 2.51	tonnes/hectare	to tons/acre	divide by	÷ 2.51
	cwts/acre	to tonnes/hectare	divide by	÷ 8.00	tonnes/hectare	to cwts/acre	multiply by	× 8.0
	cwts/acre	to kilogrammes/hectare	multiply by	× 125.00	kilogrammes/hectare	to cwts/acre	divide by	÷ 125.0
Volume / Acre	pints/acre	to litres/hectare	divide by	÷ 0.712	litres/hectare	to pints/acre	multiply by	× 0.712
	gallons/acre	to litres/hectare	multiply by	× 11.233	litres/hectare	to gallons/acre	divide by	÷ 11.233
	lbs/cu.ft	to kg/cubic metres	multiply by	× 16.052	kg/cubic metres	to lbs/cu.ft	divide by	÷ 16.052

Length	1 metre	=	100 centimetres
		=	3.28 feet
		=	1.09 yards
	1 yard	=	3 feet
		=	0.914 metres
Area	1 sq. metre	=	1.20 sq.yards
	1 sq. yard	=	0.836 sq. metres
	1 hectare	=	10,000 sq. metres
	10,000 sq. metres	=	2.471 acres

Volume	1 litre (1,000ml)	=	35.21 fl.oz
		=	1.76 pints
	1 gallon	=	4.55 litres
Weight	1 gramme	=	0.036 ounces
	1 kilogramme	=	35.21 ounces
		=	2.21 pounds
	1,000 kilogrammes	=	1 metric tonne
	1 ton	=	1.016 tonnes