

Edition 1



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NEWSLETTER

October 2018

Welcome to this, the first edition of the GBR Technology newsletter! It's an exciting time within our company. Our amenity business is going from strength to strength and along with this is a move to larger, more modern premises. Our manufacturing operations are expanding and our export plans are coming together to see further growth in overseas sales. We've even recently been invited to an invitation only event at the Houses of Parliament in November for SME manufacturing organisations to be hosted in the Churchill Room! Reading this you will likely be an existing customer or had previous contact with us but maybe this is the first contact you've had with us - on the back page I've answered some questions put to me which I hope gives you a good flavour of the company. This newsletter aims to be informative as well as to give you a unique insight into our company and how it works (we think you may find this openness refreshing and interesting) - we hope you get something useful from it and of course we are open to suggestions on what to include - please do email us at info@gbrtech.co.uk or feedback to a member of our staff.

Paul Morris
Managing Director

We are on the Move!



.... details on the back page

The Application and Benefits of Dew Dispersants

Dispersing dew and guttation fluid from your sward can have a number of potential benefits – the obvious one being early morning playability on the greens and the ability to get a good clean cut when mowing.

Switching and mechanical methods can be quite time consuming and do not stop the dew reforming. Spray applied dew dispersants can work for a week or more and of course they are keeping the leaf drier throughout the day and night. If you are switching then the sward may be covered in water droplets throughout the night and these surfaces may prove to be more prone to fungal diseases.

Dew and Guttation fluid: Dew is moisture that condenses out of the atmosphere onto a plant surface. Guttation fluid is moisture that is secreted from within the plant out onto the leaf surface. In essence they both produce water droplets on the leaf surface which will affect play.

Dew dispersants can also disperse rain – again extending playability and giving a drier leaf surface that may be less susceptible to certain diseases.

So how should a dew dispersant be applied to maximise effect?

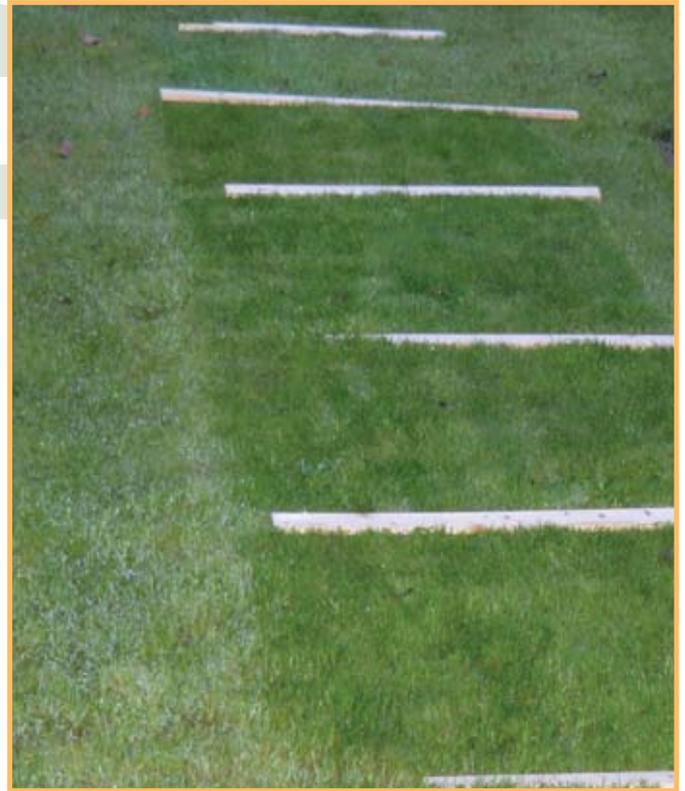
Firstly - and this is rather important – a dew dispersant should not be applied to grass that already has a lot of moisture droplets on it. You have to first pick a dry day, or start with a switch, or indeed apply before the last dose of dew dispersant has fully worn off. If attempts are made to apply to a surface that has droplets on then as soon as the dew dispersant spray hits the leaf surface you break the contact angle of the existing drops – these will then pretty much immediately run off the leaf taking much of the dew dispersant with them before it's had a chance to fix itself to the leaf surface i.e. you have largely wasted your spray!

It's also worth to note that some adjuvants in plant protection products may also bind to the leaf so strongly that they prevent the dew dispersant getting to the leaf surface too. This is very rare and most plant protection products would not contain such adjuvants but this does appear to explain one or two cases (that we have seen) of dew dispersants not working. If this does happen to you – think what you applied in the 5 days before the dew dispersant application – it may be that this isn't compatible.

One other point to consider is what you may tank mix with a dew dispersant. Most anti-foams have finely dispersed, normally hydrophobic, particles in. On a surface, for instance a leaf, antifoams can cause dewetted areas and again affect the action of a dew dispersants. Also, under highly acidic conditions (below about pH 4) then many dew dispersants can break down chemically by a process of hydrolysis which again can stop them working, thus do not mix with spray tank acidifiers that will bring the pH below 4.

Once on the leaf then a dew dispersant should do its job – day or night – rain, dew or guttation – for a period of time. That period does then vary – the most obvious factor is growth and cutting. Growth generates a fresh surface that will not have dew dispersant on (although some migration can occur on a microscopic level to the fresh surfaces) and of course cutting and boxing off will remove leaf tips with the dew dispersant on. It is even likely that heavy foot traffic can have some effect.

Under optimum conditions (and if applied correctly) a well formulated dew dispersant can give a pretty good effect for 3-4 weeks but in most cases with the best products under typical conditions you won't quite get



Test plots between batons of various formulations 10 days after application on a lawn. The furthest baton set is an untreated control.

that period of longevity. If you can get a programme of application every 2 weeks this may be a good routine to get into.

One of the most interesting benefits (especially with the loss of iprodione) is the potential of a drier sward to have less incidence of fusarium patch and other fungal disease. Theory would suggest that dew dispersants due to their continued ability to shed water from the leaf should see benefits in this respect over switching alone.

It should be pointed out that different products from different suppliers do perform differently in this product category as the chemistry used and its concentration in the product does vary across brands. Despite the discussion here, manufacturers guidelines should be followed for each product.



GBR's Dewel

Spray applied liquid wetting agents are normally broadly categorised into two types: residuals and penetrants. Residuals are so called because they are designed and applied at sufficient amounts to RESIDE in the profile for an appreciable amount of time – a month or more. Penetrants are so named due to their ability to help water penetrate even further into the profile.

Wetting Agents

How do they really work?

Wetting agents are surfactants and surfactants migrate to interfaces (surfaces) and lower interfacial tension (surface tension) – that enables surfaces that might resist being wetted (e.g. hydrophobic surfaces) to be readily wetted i.e. water and water soluble nutrients can get to all parts of a root zone rather than being actively repelled from hydrophobic areas.

A principle of wetting is that ready wetting occurs when the surface to be wetted has a higher surface energy than the liquid that is wetting it. Water has a high surface energy (or surface tension) of around 72.8 dynes/cm – so you would need a relatively high energy surface for water to easily wet it. Clean sand is a very high energy surface so no problems there, however, other components of soil and plant and animal breakdown material may produce low energy surfaces that are much harder to wet. This situation can be made much worse with either very dry conditions or anaerobic conditions.

Residuals

Of course the surfactant when added to water lowers the surface tension allowing it to wet increasingly hydrophobic surfaces. But what happens when you spray a residual onto the soil? Ok that spray tank – say 600 litres will readily wet the profile but once there it will adsorb and concentrate at the solid surfaces within the soil profile. As irrigation and rain falls over the coming days and weeks the improved wetting occurs mostly not because the water has a surfactant in it and has had its surface energy lowered but that the soil particles have surfactant on and have had their surface energy INCREASED. In reality there will be a bit of both modes of action – the water once applied will get some surfactant partition into it which lowers its surface tension but it is more a case of the polymer surfactants coating the particles and raising their surface energy.

With a residual, residence time will be very important with monthly applications – over time the surfactant will breakdown through biodegradation and will also be washed out of the profile too. We really want it to last as long as possible otherwise if concentration drops below a certain point then we might get areas develop that cannot be readily wetted.

Depletion by water wash-out might seem at first sight to be the most obvious means to deplete the surfactant concentration but bear in mind during many summers evapo-transpiration may actually mean that applied water doesn't actually penetrate below the rootzone for long periods. It's logical then in these cases that washout will not really contribute much to the depletion of the surfactant over time. However; in summer with microbes very active in the soil and the wetting agent highly dispersed it's clear then that biodegradation is likely to be the main mechanism of breaking down the surfactant in the soil. With active microbes, especially aerobic ones, biodegradation can occur and ultimately it is a chemical reaction (generally

accepted as likely to be by a process of successive methylation from the ends of a polymer surfactant molecule). The general rule for chemical reactions is a doubling of reaction rate for every 10 degrees Centigrade that the temperature increases. So you can see how elevated temperatures can significantly speed up surfactant breakdown (when microbes are active).

The formulation of the best residual wetting agents should bear in mind longevity as well as absolute wetting performance whilst ensuring of course the surfactants used do not damage grass health when applied at the rates required.

Penetrants:

The mode of action of penetrants is rather different. There is not the focus on applying a product that will last for a month – so the good news is you don't have to put as much down and this opens the door to a wider range of chemistries that can generate even lower surface tensions and ones that if applied at residual rates would be too aggressive for the grass and cause leaf damage through for example their detergency and de-waxing ability.

So how does a penetrant actually work – what is it doing? Penetrants tend to use surfactants of shorter molecular weight than residuals and ones that lower surface tension even more dramatically and normally molecules that are also more water soluble. A penetrant surfactant will go into the soil of course as does a residual. However; when water is then applied via irrigation or rain, as it goes into the soil the penetrant surfactant will partition into the water and since it has much greater surface tension lowering effect than a residual this will result in a more dramatic reduction in surface tension to the applied water. This water will then have the ability to penetrate deeper into the profile and also to penetrant into even more hydrophobic areas of soil more rapidly on account of its lower surface tension.

The penetrant surfactants that are typically used may also biodegrade rapidly when finely dispersed in soil so their effects are often short lived on account of this reason plus their faster washout and lower treat rates. In essence – don't expect more than a weeks activity at the very best from a penetrant. Of course the effects that they bring by allowing water in may last longer.

If dry patch is evident already or soil has already become very hydrophobic then penetrants will bring the fastest recovery and have the best wetting ability.

Work is underway at GBR Technology to develop longer lasting penetrant formulations by incorporating surfactants with both good wetting ability, low toxicity and a greater degree of resistance to biodegradation.



GBR's Hydrozone and Intensive Wetter

Q&A

MD Paul Morris
answers questions

Thank you Paul for taking some time today to answer some questions for the first GBR newsletter. It's all very exciting, so let's start!

So, what's the ethos of GBR Technology?

I'd have to say customer service, quality, fairness and a sense of fun and enjoyment in what we do. We've always represented premium brands in our lubricants activities and when we entered amenity markets about 10 years ago we weren't about to change this focus. A big part of it of course is about sourcing quality products – so for example when it comes to surfactants it's BASF, Dow Corning and other multi national chemical companies. If you don't buy the best raw materials you can't guarantee the best product quality. Of course there is much more to it than that – the best raw materials are only a starting point to make the best products. The next bit – formulating and then blending are also rather important too!

That's really interesting, so what then makes you good at formulating and blending?

As far as formulating goes this is in the hands of Alan Follett and myself. Both degree chemists (Manchester and Oxford – both Universities having excellent Chemistry schools) with many years of experience working with surfactants. Alan started off in Henkel formulating surfactant based products for janitorial markets followed by a career at Castrol in the industrial cleaning side – International Technical Support followed by Product Management. As for myself – I was a Product Development Chemist at Castrol for 11 years – again primarily on surfactant based products and I then spent 7 years at BASF in surfactant sales. It's a pretty extensive track record and is clearly reflected in the quality of our products. Technical sales staff are also involved in the process and take a proactive and vital role.

When it comes to blending – we have procedures – blend sheets, quality control, ISO 9001 accreditation, etc., but again it's also down to the quality of

the people and I'm happy to say we have some really great staff – without exception everyone takes care and has a sense of pride in what they do.

When asked about ethos you mentioned customer service and fairness – tell me about those.

Yes – well customer service and fairness were clearly a strong part of the company when I started. Very handy – there was nothing to change in this respect. Things have always been done to a high standard and people do get upset if they make mistakes and put them right pretty quickly. We spend a lot of time advising customers and often don't have our commercial hat on when we do this – we just do it. We help our customers where we can - be they big or small. On fairness – we do try to be very fair – treat how we like to be treated. There are many cases in our modern world where companies aren't as fair as they should be. Things do go wrong sometimes and at these times we recognise that how we respond is key – we like to do this for the benefit of the customer but also our own peace of mind and sense of satisfaction.

You also mentioned fun and enjoyment?

Work can be enjoyable much of the time and I think we are all pretty young at heart here, positive and have a good and active sense of humour. We are lucky – work is a place where we get to enjoy interactions with other staff and also customers and suppliers. It's easy to under estimate just what we get from all the relationships we form at work amongst colleagues, customers and suppliers. Much of the time we can really enjoy time together but of course life has its ups and downs and we all go through difficult times and need support and understanding.

That's great Paul! Do you have any final things you'd like to say?

I think I have captured well some of the ethos of the company. I know this was about us but it gives an idea to customers of what they can expect. We have a good sized amenity customer base that is expanding strongly still and will do so for a number of years to come. How we work impacts our customers – so to swing it back to how it helps them – it's about having a supplier of excellent products that is attentive to their needs, very fair in its dealings and hopefully enjoyable to interact with!



We are on the Move!



25 years ago, GBR Technology took up residence at Unit 6 Calleva Park, Aldermaston. As the company's sales increased, it gradually grew to take on Units 7 and 8 as well. The good news is that we have now outgrown all these units and are moving to significantly larger and more modern premises on Easter Park, 2 miles from where we are currently.

Managing Director Paul Morris comments: "To continue to grow and serve our customers well, we have taken the decision to move to larger and more modern premises. It is a genuinely exciting time in our growth as a company. Unit 42 Easter Park will give us over 3 times the warehouse and production space as we have currently. For us it will both streamline our current operations and enable us to make more products for more customers. For our customers it means maintaining the shortest possible lead times on the majority of items we make in-house and an expanding range of products - in essence, more choice and quicker delivery. As well as home markets we also have aspirations to significantly grow our export business - with our manufacturing operations being the fastest growth area in GBR we are confident we can leverage this to build more overseas distributors and users "

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