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BASIS / FACTS CP/37773/1415/g 2 CPD points (1CP, 1AP)

NRoSO NO460390f 2 CPD points

Cover picture courtesy of Tim Schrader, AgriPhoto
editorial

Congratulations! Another record crop

Welcome to the spring edition of the British Sugar Beet Review. I would like to take this opportunity to introduce myself as the new editor. I joined British Sugar in 2004 and the majority of that time was spent as the grower and manager of Cornerways, British Sugar’s tomato growing business situated at the Wissington Factory. Last year I joined the Agriculture team as Yield Development Manager and very much look forward to meeting and working with you.

Despite the very challenging and increasingly competitive sugar marketplace our industry has once again shown its collective strength with another record sugar beet yield and factory performances in all of our regions. All parties working effectively together will continue to be essential to the industry’s future success. The record crop yield and factory throughput sets the tone for the future and builds on already strong foundations.

In this edition, several of the current hot topics have been covered for example, nitrogen nutrition. The team from the BBRO look at the current knowledge on nitrogen and apply this to some of the topical questions being asked. We also have Debbie Sparkes providing some answers to some of the most frequent questions posed to the BBRO. In addition, there are updates from the NFU covering employment law and pesticide regulations which I strongly recommend reading. We also have the first article of a regular update from Daniel Godsmark on the activities of the BBRO R&D team.

As the incoming editor I am really keen to hear from you regarding your thoughts on the British Sugar Beet Review and the content so please feel free to get in touch on beetreview@britishsugar.com. We will be running a regular ‘Letters to the Editor’ feature where a selection of your letters will be published to stimulate comment and debate on sugar beet growing. I look forward to hearing from you.

With drilling of the 2015 crop starting from early March let’s hope for favourable early season conditions to set the crop up for another record year!

Paul Simmonds
Editor

BBRO Summer Open Days 2015

Don’t forget to take advantage of the 2015 Summer Open Days which promise to provide an excellent opportunity to hear the latest technical presentations, as well as meet industry people and trade exhibitors.

12th May – Wissington
Grimston, King’s Lynn, Norfolk

14th May – Newark
Bracebridge Heath, Lincoln, Lincolnshire

19th May – Cantley
Salhouse, Norwich, Norfolk

21st May – Bury St. Edmunds
Ixworth Thorpe, Bury St. Edmunds, Suffolk
Sugar beet nutrition – the facts

Questions asked most frequently by growers around crop nutrition include; whether the higher plant densities and greater yields of current crops require larger inputs of N; whether the soil’s potassium status has an effect on the efficiency with which crops can take up and use N; and how far can sodium be used in place of potassium in the crop’s nutrition. This article reviews these questions and summarises our current understanding of the roles of nitrogen, potassium and sodium in the nutrition of UK sugar beet.

Apart from a few product trials, there has been very little new research on the nutrition of UK sugar beet since it was last reviewed for inclusion in the 8th edition of the Fertiliser Manual for Agricultural Crops (RB209). This manual’s recommendations for sugar beet, which are intended only as a general guide to fertiliser practice, are summarised in the 2015 BBRO Sugar Beet Reference Book. The recommendations are based on work done 15 to 25 years ago, since when many crop production practices have changed. For instance, whole-beet delivery practices have been introduced, recommended plant populations have increased from 70-80 to 90-100 thousand plants/ha, and yields have, on average, increased by 30-40%. Growers are questioning whether these changes could have implications for the nutrition of the crop and fertiliser practices.

My sugar beet crops now tend to have pale green leaf canopies in the autumn – does this mean they required more N?

Nitrogen is the main driver of the spring growth of sugar beet, providing temperatures and rainfall are adequate. Sugar beet crops need to acquire 220-250 kg N/ha to produce maximum yields. Much of this N is taken up during the early months of growth when it is primarily used to produce the leaf area needed to intercept the incoming radiation. Full interception requires a minimum 3 m² of leaf area/m² soil (i.e. a leaf area index, LAI, of 3), and 30 kg N/ha is required to produce each unit of LAI. Nitrogen is an essential component of the chlorophyll that gives leaves their green colour, and of the primary photosynthetic enzyme, ribulose bi-phosphate carboxylase (Rubisco). However, the leaves contain far more Rubisco than they need simply for photosynthesis, because Rubisco is also a storage protein. The plant uses this protein to accumulate and store N for subsequent use in the later growth of the plant, especially that of the storage root. Plants tend to continue to accumulate this store of N during the spring for as long as soil supplies allow. Consequently, crops that have access to large amounts of N will produce large, dark green leaf canopies that tend to ‘please the eye but not the pocket’. As will be discussed later, the redistribution of N from the shoot is greatly influenced by the use of late-season strobiluron and azole-type fungicides.

Crops grown on mineral soils generally deplete the soil profile of the N that is present at drilling or applied as fertiliser quite early in growth, leaving later uptake dependent on the mineralisation of N from soil organic matter. If this is insufficient to meet the crop’s demand, plants may need to remobilise some of the N from the Rubisco protein in the shoot to support growth and sugar accumulation in the storage root. This causes leaf canopies to become paler in colour in the autumn. However, the leaves retain sufficient Rubisco to continue to photosynthesise and, as Malnou et al. have shown (Ref. 1), for the leaf canopy to remain as efficient in the interception and use of incident radiation and production of sugar as a dark green canopy. The same study also showed that, whilst late applications of N generally improve the appearance of the leaf canopies, they only increase the amino-N content of the beet, but not yield. The occurrence of a pale-green leaf canopy in a high-yielding crop in the autumn is, therefore, more likely to indicate that it is making more effective use of the N that it has, rather than it requires more N. The same is probably true for those varieties that naturally have paler leaf canopies.

The amino-N contents of delivered beet have decreased progressively in recent years – does this mean crops require more N?

Between 1995 and 2005, the average amino-N content of beet sampled in British Sugar’s pre-campaign surveys decreased sharply from 200 mg/100g sugar and, during the past decade, has stabilised at around 75 mg/100g sugar. This decline in amino-N content of sugar is more closely related to a decrease in the amount of amino-N (kg/ha) that beet accumulate (which has halved) than to the much smaller increase in sugar yield (Fig. 1).

Because high amino-N concentrations are correlated with large uptakes of N, factory tare-house measurements were used in the 1980s and 1990s as a guide to the potential overuse of N in fertilisers and manures. This undoubtedly...
It is therefore unlikely that the decline in the amino-N concentrations of delivered beet seen in recent years has been caused by crops receiving too little N; it is more probably a sign that they are making more efficient use of the N that they have taken up. The greater use of late-season fungicides could, however, have the unwanted effect of greater quantities of N being returned to the soil when the tops are ploughed in. Further research is needed to quantify the potential environmental effects.

**Do high-yielding crops and high plant populations require more N?**

The answer to this is more problematic. The present recommendations are that 90-100,000 plants/ha are needed to obtain maximum yield and that crops grown on most mineral soils require 90-120 kg N/ha; the higher rates being the maximum that can be applied in nitrate vulnerable zones. However, these fertiliser rates are only general guidelines derived mainly from trials done 20-30 years ago in which the effect of plant number was usually only examined at the rate of N recommended for the site, and responses to N usually only examined at the then recommended plant density of 70-80,000 plants/ha. Many European growers who obtain particularly large yields use substantially greater plant populations and amounts of N, but there is no clear scientific basis for recommending these practices in the UK. Recognising this, the BBRO has recently commissioned new research to examine the interactions between N rate and plant population density for high-yielding crops grown according to current UK practices. Interesting responses have been obtained in some, but not all, of the first year's trials, but it is much too early to draw meaningful conclusions until the four-year project is complete and we have a better understanding of the situations under which yields may be profitably increased, and the environmental implications of any changes to practice have been clarified.

**Does the status of other nutrients affect the growth of my crops and their response to N fertiliser?**

The five nutrients most likely to affect sugar beet yield are potassium (K), sodium (Na), phosphorus (P), magnesium (Mg) and sulphur (S). Surveys show that few sugar beet soils are currently seriously deficient in P, largely because phosphate fertilisers have been used effectively in the past. Magnesium deficiencies tend to be localised and associated with acid soils, and responses to applied sulphur in the few trials so far done have been rare and small. Current advice is to continue to apply basal rates of P, to apply Mg if protracted deficiency symptoms occur, and to apply sulphur only if deficiencies are seen in other, more sensitive, crops within the rotation.

Our thinking on the K and Na nutrition of sugar beet has been revised as a result of the BBRO’s definitive studies done on Rothamsted Research’s K-reference plots (Ref. 2). These plots are located within single fields on a silty clay loam and a sandy loam soil and have an extremely wide range of exchangeable K established through many years of differential potash fertilisation. The plots were sufficiently large to allow both the crop’s responses to soil K to be examined, as well as their interactions with freshly-applied N and Na fertilisers. The research confirmed that to obtain maximum yield, the late-season application of these fungicides and more than one half of the crops receive two (Fig. 2).

**Fig. 1 – Recent changes in amino-N content of beet.**

contributed to the rapid decline in the amino-N contents of delivered beet seen during the late 1990s. However, another contributory factor in recent years, has been the greater use of late-season, strobilurin and azole-type fungicides. These not only control foliar diseases, but also physiologically decrease the rate at which leaves senesce and die – the so-called ‘stay-green’ effect. This prolongation of the functional activity of the leaf canopies not only allows crops to continue to accumulate sugar well into the autumn, but also ensures that less of the shoot’s N is exported to roots late in the beet’s growth, to accumulate as amino-N. The use of late-season fungicides has increased significantly since the azoles were introduced in the late 1990s and followed later by the strobilurins. Most sugar beet crops now receive at least one
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concentration of exchangeable K in the soil needs to be maintained at 120-180 mg/kg soil (i.e. K Index 2), irrespective of soil type. It also confirmed that freshly-applied K fertilisers do not greatly increase yield, strengthening the view that applications of K should primarily be applied to manage the long-term K status of the soil, rather than with the intention of increasing the yield of the current crop.

A significant finding, confirmed by measurements on commercial crops, is that crop uptakes of K and N are strongly correlated (Fig. 3). The physiological basis for this correlation is that N drives growth by increasing the number and sizes of the cells within plant tissues, thus increasing the total cellular volume of the various plant organs. The increased volume requires sufficient osmotic solutes to maintain the cellular turgor (rigidity) that is the force that actually drives growth. Plants mainly use potassium for this purpose but, unlike many other plants, sugar beet tolerate sodium and can, if necessary, use it as an alternative osmotic solute.

How far can fertiliser potassium be replaced by sodium from agricultural salt?

Because of its maritime origin, sugar beet is one of the few arable crops that tolerates sodium. Consequently, it has long been believed that agricultural salt can be used as a cheaper alternative to fertiliser K in this crop. It is becoming increasingly apparent, however, that the physiological roles of the two nutrients are not as interchangeable as first thought. For instance, potassium is far more mobile and more evenly distributed within the plant than sodium, and more actively involved in the transport of sugar to the root. Sodium, on the other hand, accumulates almost entirely in the shoot and, being very immobile, is not involved in sugar transport nor is it redistributed to the rest of the plant as the leaves die.

Because of this interdependence of K and N in the plant’s nutrition, a shortage of exchangeable soil K in the soil will affect the ability of the crop to take up N and the efficiency with which it is able to use fertiliser N (Fig. 4). In the case of sugar beet, the effect can, to some extent, be alleviated by the plant’s ability to use sodium as an alternative to potassium. The situations under which they do so are discussed below.
Many trials have shown that yield responses to applied sodium are usually only obtained on low K Index soils that contain less than 25 mg Na/kg soil (Fig. 5a). More significantly, it has now been shown that when soils contain more than 120 mg/kg of exchangeable K, i.e. are at or above K Index 2, the crop takes up very little of the sodium that is applied as a fertiliser (Fig. 5b; Ref. 2).

Given these findings, data collected in British Sugar surveys during the past five years show that large amounts of agricultural salt are currently being applied to many sugar beet crops that are unlikely to benefit from it (Fig. 6). The soils of a quarter of the surveyed acreage were below K Index 2 and crops grown on these soils were those most likely to benefit from the sodium they were given (which averaged 190 kg Na/ha). The soils of the other three quarters of the surveyed acreage were at K Index 2 and above and not deficient in K. However, crops grown on these soils also received an average of 165-170 kg Na/ha from which they were unlikely to gain benefit. A ‘back-of-envelope’ calculation, based on this data, suggests that the cost of this over-use of agricultural salt could be as high as £8 million per year.

**Conclusions**

Pale leaf canopies in the autumn and low amino-N contents in delivered beet do not necessarily mean crops require more N, merely that they are using the N that is available to them more efficiently.

The BBRO has commissioned a new four-year project on the interactions between plant population density and the nitrogen requirement of high-yielding crops under current growing practices.

Work on potassium and sodium interactions in sugar beet nutrition indicates an unnecessary use of agricultural salt in the national crop that needs to be addressed.

**References**


New research collaborations announced

Once again, BBRO held its annual conference at the spacious Peterborough Arena. The event, on the 10th of February, was well attended with representatives from the whole UK sugar beet industry. There were numerous equipment and other commercial stands for delegates to explore between the BBRO sessions.

This year, BBRO took the opportunity to showcase its current portfolio of research projects in a poster session. This was placed at the centre of the venue and was well attended throughout the day. It gave the researchers involved a great chance to discuss the projects in more detail with growers and advisers. In this article, I have given a brief summary of the presentations from the day but the event can also be viewed in more detail online.

Healthy Harvest
Don Pendergrast

Don, the NFU’s Plant Health Adviser, explained the importance of all growers and others in the industry getting involved in the ‘Healthy Harvest’ campaign.

One of the biggest challenges facing the world today is to produce enough food to feed the growing population. However, the overly precautionary EU
regulation of crop protection products is increasingly undermining European farmers’ vital crop production toolbox. The very real fear is that, during the five-year life of the European Parliament, the 250 active ingredients still available to the UK could be cut by at least a quarter under existing legislation, and may even be halved. It is for this reason that the NFU, CPA (Crop Protection Association) and AIC (Agricultural Industries Confederation) launched ‘Healthy Harvest’ in June 2014, with the aim of safeguarding the crop protection toolbox. They followed this by commissioning Andersons Farm Business Consultants to carry out an independent study of the potential impact of the loss of plant protection products on UK agriculture and the wider economy. For more details on this report, and one commissioned by Agriculture and Horticulture Development Board (AHDB) (and also outlined by Don) see page 24 for Emma Mundy’s article ‘Pesticide legislation update’.

**BBRO crop protection priorities: delivering a healthy crop for the future**  
*Dr. Mark Stevens*

Crop protection remains vital for a successful sugar beet crop: to limit the impact of pests, diseases and weeds and to maximise growers’ yield returns. Currently, the BBRO invests approximately 30% of the R&D levy to provide surveillance, diagnostics and new control options for existing disease threats, such as rhizomania, virus yellows and beet cyst nematode. It also keeps a ‘watching brief’ on new problems such as stemphylium leaf disease, which was identified, for the first time, in East Anglia during 2014.

In his presentation, Mark outlined some of the issues currently faced by the industry and how BBRO is responding on the growers’ behalf. He highlighted the importance of the current portfolio of crop protection work and outlined the new BBRO directly-supported projects for 2015. He also introduced two new exciting projects, led by BBRO, and worth over £2.6M over the next five years. These involve consortia consisting of both industry (from the science, engineering and telecommunications sectors) and academia. One project will produce real-time in-field systems for monitoring pest and disease risk, and the other will develop novel virus yellows resistance.

**Grower’s view of GPS in practice**  
*David White*

RTK Farming, from the idea of two farmers helping each other with RTK signal provision near Cambridge, have developed a network covering East Anglia and now some of Lincolnshire. Our regional government development agency, East of England Development Agency (EEDA), have an ambition to bring the benefits of precision farming technology to arable farmers in the region and have made some funding available. David gave an explanation of the network and how, through the adoption of GPS steering, he and his colleagues quickly moved from just being able to drill straight rows to taking much more advantage of the system; using it to control many aspects of cultivations and wheelings, and precision application of plant protection products and nutrients to cereal and row crops on their farms. This change has brought huge benefits in terms of easier soil management, better use of manpower and reduced costs of inputs. He suggested that this is something all growers can, and should, look to be doing in the future.

**Modern drill technologies**

Three manufacturers presented their latest seed drills.

**Graham Owen – Kverneland**

Today’s machines are not only using RTK-GPS for section control, auto on/off and eliminating overlaps, but can also include the latest innovation, GEOseed, where seeds can be placed in two-dimensional patterns. Graham highlighted the establishment of oilseed rape with their Monopill drill, giving the owner a second crop, which can be established using the machine. He also talked about strip-tillage as a new method of establishing the beet crop that can reduce the number of passes required to establish the crop with no detriment to yield.

**Roland Dines – Vaderstad**

Roland introduced the Tempo precision drill, a machine that has established itself as a market leader in the world of maize production and is now available for use by sugar beet and oilseed rape growers. The Tempo uses ‘power shoot’ technology, electronic drive and an E-control system that integrates both ISOBUS and Apple’s iPad to offer operators a unique control system. There are now models to suit all requirements as the range includes row spacing down to 40 cm, machine widths up to 12 rows, vertical folding, accurate fertiliser placement and a host of other options.
Steve Twist – Toucan Farm Machinery

Steve, of Toucan, outlined the features and benefits of today’s modern range of Monosem sugar beet drills. The range has been developed using the company’s experience and technology that has been adopted to provide drills for UK sugar beet farmers and for all UK conditions.

BBRO’s most common questions

Dr. Debbie Sparkes

Debbie is an Associate Professor in Agronomy at the University of Nottingham and works closely with BBRO as a member of the Research and Development Board.

Debbie’s presentation addressed some of the questions that BBRO is frequently asked by growers and advisers. The questions she considered included: ‘Are current nitrogen recommendations suitable for high yielding crops?’, and ‘Are some sugar beet varieties better suited for late lifting?’ Debbie answered the questions by reviewing the underpinning science, and presenting relevant data. For more details see Debbie’s article on page 13.

Making Sense of Sugar

Dr. Julian Cooper

Julian is Head of Food Science for both British Sugar and AB Sugar and has responsibility for new product/technology development, external scientific research, health and nutrition, and food law.

He presented an engaging paper on the new campaign, ‘Making Sense of Sugar’, highlighting many of the key facts about sugar and outlining some of the future uses of sugar. The important points from this presentation can be found on www.makingsenseofsugar.com

Catch cropping and nutrient management

James Beamish and Andrew Lovett

James and Andrew introduced a project that is a collaboration between the University of East Anglia (UEA) and Salle Farms. The farm is a 2,000 ha estate in Norfolk where sugar beet is grown on 250 ha per year as part of a seven year crop rotation. Yields are typically above the regional average, with gross margins ranging from £1,300 to £1,700 per ha.

Since 2010, the estate has been host to monitoring equipment maintained by the Wensum Demonstration Test Catchment project. This is part of a national initiative that seeks to evaluate the extent to which on-farm mitigation measures can cost-effectively reduce the impacts of water pollution, whilst maintaining food production capacity. As part of the research programme, cultivation trials are being conducted on nine fields (totalling 143 ha) to assess the impact of cover crops and reduced tillage techniques on soil properties and nutrient balances.Oilseed radish was identified as a suitable cover crop to include in a rotation involving sugar beet, and was established in seven fields during autumn 2013 and followed by a spring bean crop. Monitoring of field drains and soil water demonstrated that the cover crop had substantially reduced nitrogen losses, and the financial returns were similar to those from fields using more conventional practices. During the year, considerable experience was gained about the practicalities of managing the radish and this has helped to improve the on-going use of cover crops at Salle.

A customer’s view of sustainability

Quentin Clarke

Quentin, Head of Sustainability at Waitrose, gave a paper on the Waitrose view of sustainability. He outlined some of the challenges in getting messages across to consumers and also highlighted some of the common misconceptions about current sourcing across the supply chain. He explained how Waitrose engages with their suppliers, and with their partners who work for them, to keep their trust and loyalty. The aim of this is to create a model where excellence, in terms of environmental, social and economic responsibility, pays.

2014 Crop: An impressive performance

Dr. Mark Stevens

As we approach the end of the 2014/15 sugar beet campaign, every indicator suggests that we will produce a national sugar yield in excess of the previous record set in 2011/12. Mark reviewed the factors that have contributed to this success, supported by data from industry and the range of BBRO trials and research programmes. The results show what can be achieved with adoption of the good practices advocated by the BBRO, especially when combined with a growing season as favourable as last year’s.

Copies of the presentations and posters from the BBRO Winter Conference are now available to view and download from the British Sugar Beet Portal (www.uksugarbeet.co.uk) or from the BBRO YouTube channel (www.youtube.com, search for British Beet Research Organisation).

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Guidance on employment rules on farm

An understanding of the regulations governing employment is a must for any farm business. Whether employing full time, part-time or casual labour, the protection of workers’ rights is of great importance.

There are certain requirements that employers must meet. With the ending of the Agricultural Wages Board and a recent tribunal ruling on holiday pay, it is essential for farm managers and employers to check that they are up to date with the law in this area.

Pay

It’s been just over a year since the Agricultural Wages Board (AWB) was abolished. Before 1st October 2013, agricultural wages in England were regulated under the Agricultural Wages (England and Wales) Order 2012 (AWO 2012). Employment in the agriculture sector is now governed by national employment legislation, with the national minimum wage set at:

- £6.50 per hour for employees aged 21 and over
- £5.13 per hour for 18 to 20 year olds
- £3.79 per hour for 16 to 17 year olds
- £2.73 rate for an apprentice

Rates are usually updated every October. Of course, businesses often choose to pay more than the minimum rates set out above. The rate for apprentices is for those aged 16 to 18 and those aged 19 or over who are in their first year. All other apprentices are entitled to the national minimum wage for their age.

Agricultural and horticultural workers employed on or before 30th September 2013 are protected by the AWO 2012, unless they have agreed with their employers to change the terms of their employment.

Workers provided by another party

Labour providers

A ‘gangmaster’ supplying labour to businesses in the agricultural, horticultural, shell fish gathering, and food processing and packaging sectors is required to register his business with, and obtain a licence from, the Gangmasters Licensing Authority (GLA). The term ‘labour provider’ is another term for ‘gangmaster’ and is used in many contexts. Consequently, the GLA’s regulatory remit also captures employment agencies, and others who supply labour to the sectors listed above.

Whilst the law provides regulations that exclude certain labour supply arrangements, which are viewed as posing a low risk of worker exploitation, these exclusions are narrow. Consequently, farmers and growers would be well advised to consider the scope of this legislation in detail to ensure that their operations are compliant. A complete list of these narrowly defined exclusions and associated guidance is available on the GLA website.

The licensing scheme applies to all workers, regardless of whether they are temporary or permanent, migrant or resident, skilled or unskilled. The labour provider requires a licence whether the labour is supplied directly to a farmer or grower, or to another labour provider who then supplies it to a farmer or grower.

The above requirement also applies to foreign labour providers who recruit workers for UK businesses. For example, if a Polish employment business recruits workers in Poland for placement by a UK employment business on UK farms, both the Polish and UK employment businesses will require GLA licences. The GLA will also expect the Polish employment business to comply with Polish law when conducting its operations in Poland to recruit workers who are ultimately supplied to labour users in the UK.

Acting as a labour provider without a licence is a serious offence, with a maximum sentence of:
Labour users

Under the Gangmasters (Licensing) Act 2004, it is an offence to use agricultural labour supplied by an unlicensed labour provider. Agricultural labour users, including farmers and growers, therefore, must ensure that their labour providers hold valid GLA licences.

This can be done by searching the Public register provided on the GLA’s website or by subscribing to the GLA’s ‘Active Check Service’. Labour users can also check the minimum charge rates table provided by the GLA to ascertain whether their labour provider is charging an acceptable rate.

Further information on this is provided on the GLA’s website alongside a checklist of operations that labour users can undertake.

Holiday pay

How much holiday is a worker entitled to?

The Working Time Directive (WTD) gives all workers in the EU the right to 4 weeks’ (20 days) paid holiday each year. An additional entitlement of a further 1.6 weeks’ (8 days) paid holiday is compulsory in England and Wales under the Working Time Regulations 1998 (WTR). In addition to the statutory entitlement, workers may also have an entitlement to extra holiday provided by their employers under their contracts of employment.

In addition to the statutory entitlements outlined above, workers employed on or before 30th September 2013 continue to be entitled to the enhanced holiday rights provided by the AWO 2012, unless agreed otherwise.

Generally speaking, it is not permissible to offer workers a payment in lieu of the minimum holiday entitlement provided for in the WTR except on the termination of employment, in which case the employee can be paid in lieu of leave accrued but not taken.

Recent developments in holiday pay calculation

Holiday pay has attracted considerable media attention recently following the Employment Appeal Tribunal’s decision in the ‘Bear Scotland’ case on 4th November 2014. The ruling confirmed that both guaranteed and non-guaranteed overtime need to be considered by employers when calculating their workers’ holiday pay.

For the avoidance of doubt, guaranteed overtime is work which the employer is contractually obliged to offer as overtime and which an employee is contractually obliged to perform. Non-guaranteed overtime is work that the employer is not obliged to provide but which, if the employer offers it, the employee is obliged to perform. Voluntary overtime does not need to be included in the calculation.

It was determined that this applies only to the basic 4 week entitlement provided under the WTD, and not to the additional 1.6 week entitlement provided under the WTR. It will not apply to any additional holiday offered by employers over and above the statutory requirement, or to the additional enhanced entitlement under the AWO 2012 beyond the 4 week minimum.

Employers in the sector may wish to review their practices on calculating holiday pay to ensure that they are compliant with the law, as currently understood.

Zero hours contracts

The use of zero hours contracts has attracted considerable attention recently, due to concerns about the way in which they are being used by some employers. One of the key areas identified is the use of zero hours contracts that contain exclusivity clauses, preventing individuals from accepting work from other potential employers. A consultation on the banning of such clauses closed in November 2014. This would ensure that workers are not prevented from accepting work from other employers when they are not guaranteed work under their zero hours contract. Limited exemptions may be provided, to cover situations where there is a genuine, important, reason for using a zero hours contract. There are likely to be further developments in this area in 2015.

Auto-enrolment

Automatic enrolment encourages people to start saving for a pension. Automatic enrolment means that, rather than having actively to choose and join a pension scheme, workers are entered into a scheme by their employer as a matter of course. If they don’t want to be in the pension scheme, they must actively choose to opt out.

All small and micro businesses are to receive letters from The Pensions Regulator in the coming months as part of a new campaign to give them key information on automatic enrolment, including when the duties affect them. A decision to write to more than 1.5 million addresses across the UK, from the end of January, aims to ensure that, by the summer, all employers know their ‘staging date’: the date when they need to be ready to meet their automatic enrolment duties.

Health and safety

Health and safety should be a key concern for agricultural employers as the nature of agricultural work often has the potential to cause serious or fatal accidents. Employers are legally obliged to take measures to protect the health and safety of their workers. In particular, risk assessments should be carried out to identify any aspects of a business that could pose a risk to the health and safety of its employees and others.

Helpful websites

Gangmasters Licencing Authority www.gla.gov.uk
NFU Online www.nfuonline.com/business/employment
NFU Holiday Pay Briefing www.nfuonline.com/business/employment/calculating-holiday-pay
HSE website www.hse.gov.uk
Farm Safety Partnership www.nfuonline.com/business/farm-safety/farm-safety-partnership
Sugar Beet: Frequently Asked Questions

There are a number of questions about the sugar beet crop that the BBRO is frequently asked by growers and agronomists. This article addresses some of the most frequently asked questions (FAQs) by looking at the science behind the issues.

FAQ 1: Are current N recommendations suitable for high yielding crops?

The yield of sugar beet is directly related to light interception by the crop. Solar radiation receipts in the UK reach a peak in mid-June, then start to decline as the days shorten. As sugar beet cannot usually be sown until early March, and growth is slow in cool spring conditions, most crops do not reach full ground cover until July, when peak radiation receipts have passed (Fig. 1). Anything that promotes earlier canopy expansion will mean that the crop captures more of the light available in May and June, hence increasing yield potential.

The main function of nitrogen in sugar beet is to promote leaf expansion and hence canopy closure, thereby maximising light interception. Unlike crops such as wheat, where N is needed also to form protein in the grain, higher yielding sugar beet crops do not require more nitrogen. George Milford covers this area in more detail in his article ‘Sugar beet nutrition – the facts’ on page 3 of this edition.

FAQ 2: Why is the UK 5th in Europe for sugar yield?

Figure 2 shows the average EU sugar yields for the period 1999-2014, with UK ranked fifth behind The Netherlands, Spain, Belgium and France. As mentioned earlier in this article, sugar yield is directly related to light interception. Alongside nitrogen, temperature is the main driver for leaf expansion, and we can use the sugar beet growth model to understand the impact of spring temperatures on canopy growth, light interception and hence yield potential. Comparing average spring temperatures in mid-Norfolk with Northern France (Lille), it is clear that, from March onwards, Lille is warmer than mid-Norfolk (Fig. 3). Hence, if the crop were sown on the same date in both areas, it would emerge earlier and the canopy would expand faster in Lille.

The sugar beet growth model enables us to visualise the impact of the differences in temperature on canopy expansion
the crops. However, as the impact of this on both locations would be the same, it is still a useful way of illustrating the differences in canopy expansion and yield potential between the two locations.

If we now compare the UK with Sweden, which is ranked 11th in Europe for sugar yield, we can see that Swedish springs are much cooler (Fig. 6), which means that the crop is not sown, on average, until mid-April. Radiation receipts, from March to September are greater due to longer days. What is the combined impact of these meteorological differences?

Fig. 3 – Mean daily temperatures in mid-Norfolk and Lille, France. (Source: helioclim.org)

Fig. 4 – The percentage light intercepted by sugar beet, sown on 10th March in mid-Norfolk (blue curve) and Lille (red curve).

Fig. 5 – Sugar yield (t/ha) of two crops, sown on 10th March in mid-Norfolk (blue curve) and Lille (red curve).

(auming everything else is equal: soil type, water availability etc. (Fig. 4)). In addition to warmer temperatures in Lille, solar radiation receipts are also slightly higher than in the UK and the combination of warmer temperatures, faster canopy growth and higher radiation receipts leads to increased yield potential (Fig. 5). The absolute sugar yields shown in Fig. 5 are lower than would be expected as only mean monthly temperature data were available, rather than daily data, which underestimates the actual temperatures experienced by

Fig. 6 – Mean daily temperatures in mid-Norfolk and Malmo, Sweden. (Source: helioclim.org)

Fig. 7 – The percentage light intercepted by sugar beet, sown on 10th March in mid-Norfolk (blue curve) and Malmo (green curve).

Fig. 8 – Sugar yield (t/ha) of two crops, one sown on 10th March in mid-Norfolk (blue curve) and the other on 10th April in Malmo (green curve).
The combination of cooler spring temperatures and later sowing means that Swedish crops receive less spring/early summer radiation than British crops (Fig. 7). The higher radiation receipts do not compensate for this and hence yield potential is lower; again, all other things being equal. While the analysis is simplistic, and does not account for differences in rainfall or soil type, it does illustrate the impact of temperature and radiation on yield potential of sugar beet (Fig. 8).

FAQ 3: Are some sugar beet varieties better suited for late lifting?

There are no UK data available to directly compare sugar beet varieties harvested at different times. Therefore, to address this question, I have looked at data from the UK Recommended List trials for 2012-2014 to see if there are any changes in variety ranking with harvest date. The trials were harvested between mid-September and mid-December, but this was not the only difference between trials, which also varied in terms of site, soil type and sowing date. Therefore, it was not possible to conduct any formal statistical tests on the data, only to examine overall trends.

For every trial that included the same group of 27 varieties, I ranked the varieties for yield performance. I then grouped trials into those harvested in September, early and late October, early and late November and December and then averaged the ranking of each variety across the three years. There was no indication, for any of the varieties, that ranking either increased, or decreased, as sowing date was delayed. Figure 9 shows the data for three contrasting varieties. Variety 1 ranks between 4-9, variety 2 between 11-19 and variety 3 between 20-24. Hence, varietal ranking seems to be fairly stable, regardless of harvest date.

The current Recommended List programme costs approximately half a million pounds a year to run. To extend this to formally evaluate the varieties across a range of harvest dates would significantly increase the cost, which cannot be justified, given that the data available indicate that there is no change in variety ranking with harvest date.

FAQ 4: Should I grow a cover crop before sugar beet?

There are many potential benefits of growing a cover crop before sugar beet: for example, reduced nutrient leaching, improved soil structure and suppression of beet cyst nematodes (BCN). There could also be potential problems, such as difficulty in destroying the cover crop in a timely fashion. However, there has been limited experimental work to evaluate the pros and cons of using cover crops immediately prior to sugar beet.

BBRO has funded a PhD studentship to evaluate cover crops in terms of BCN control and will also be undertaking further work to evaluate cover crops in relation to soil structure and nutrient management. Once this work is complete, BBRO will be in a position to advise on the use of cover crops prior to sugar beet.
Lime – from Quarry through Factory to Field

Introduction

Lime, in the broadest sense, is a vital ingredient in the production of sugar whether as a nutrient for sugar beet growth or as part of the sugar extraction process. It is needed in soil to provide calcium, the essential major element for all stages of crop growth, (Ref. 1). Use of lime as a soil additive is also necessary on many fields to adjust soil reaction (measured as pH) to near the neutral point (7). This is because sugar beet cannot tolerate acid soils, and lime is an inexpensive way of correcting this potentially widespread problem (Ref. 2).

In the factory, lime also plays a crucial role in the extraction process by cleaning the juice and allowing white sugar to be produced. This article is the first in the British Sugar Beet Review to cover the origin of this lime, and the way it is used in factories. In addition it describes the by-product, ‘LimeX’ along with its use on land to improve crop production.

Derbyshire limestone

The four British Sugar factories use approximately 190,000 t of limestone per annum. This is supplied by the company ‘Cemex’, a company which operates the 300 hectare Dove Holes Quarry, near Buxton, Derbyshire (Pic. 1). The limestone is of high quality with low impurities. British Sugar sources the rock from Derbyshire where there is an estimated 800 million tonnes of reserves. Calcium carbonate (CaCO₃) makes up 95.5% of this limestone, which was formed 354-200 million years ago during the Carboniferous period.

Currently fifteen quarries operate in the Derbyshire area, all as open-cast mines quarrying around 13 million tonnes each year. British Sugar uses 2% of that annual production. The quarrying industry is of significant importance to the local economy and a major employer. Limestone is supplied as 75-125 mm rock, which allows air-flow through the kilns when burnt at the factory sites. Such limestone is also known within the quarrying industry as ‘Sugar Stone’ owing to the British Sugar specification. At the quarry, holes are drilled into the rock seam and explosives are inserted to blast and loosen the rock. A loading shovel then digs the rock and loads it onto dump trucks (Pic. 2) that cart it to the primary crusher (Pic. 3). Once crushed, the rock needs to be washed to remove clay. This clay is an integral part of the deposits, owing to the
geological forces that folded the strata over many millions of years. Once washed, the rock is graded and secondary crushed to obtain many different grades of stone. The quarry can produce products specific to its customers, as well as EU standard sizes. Picture 4 shows the Sugar Stone size grade for British Sugar being outloaded post-screening.

**Use of limestone in the factory process**

There are other sources of calcium carbonate, that have been evaluated over the years, but none are as reliable as Derbyshire limestone. Chalk has the same chemical composition but is much softer and would not be suitable in the factory kilns. This is because a constant air flow is necessary to allow the calcium carbonate to be burnt at 1,200°C; chalk would break up and fill the air spaces. The limestone is added at the top of the kiln along with 8% (weight to weight) anthracite as a fuel source (Pics. 5 and 6).

The limestone/anthracite mix travels down the kiln, passing through the fire zone (which is about half way down). When the lime arrives at the bottom discharge point, it has changed chemically from calcium carbonate to calcium oxide (quicklime), and importantly is still in rock lumps. Next, recycled process water is combined with the quicklime in a slaker, causing the lumps to disintegrate and creating a white liquid called ‘milk of lime’, the start of the factory purification process (shown in Fig. 1).
The sugar solution still present within the cloudy filtrate is removed and returned. This goes back into the factory process and the lime ‘cake’ remaining is removed when the hydraulic pressure is released. The cake is broken up in handling and storage and sold as LimeX70 (Pic. 8).

This first stage in cleaning up the sugar solution (raw juice) extracted from beet is known as ‘first carbonatation’. The action of the milk of lime, coupled with carbon dioxide gas captured from the burning of the stone that is bubbled through the raw juice after diffusion, is to precipitate the impurities comprising non-sugars and salts with the calcium carbonate:

\[
\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{CO}_2 + \text{impurities in solution} \\
\downarrow \\
\text{CaCO}_3 + \text{H}_2\text{O} + \text{precipitated impurities}
\]

The calcium carbonate (CaCO₃) and precipitated impurities are filtered off from the now cleaner sugar solution and the residual lime slurry is pressed to make LimeX70. Second carbonatation step repeats this process, with slight modifications to improve the cleanliness of the juice. The relatively small amount of precipitate filtered off is returned to the first carbonatation and eventually added to the LimeX production. The sugar juice is now quite clear and goes forward to be processed into the end product.

**Production of LimeX70 and LimeX45**

At the Bury St. Edmunds, Newark and Wissington factories LimeX70 is produced by pressing out water from the lime remaining from the sugar production, which reduce water content to c.30%. These ‘dry lime presses’ (Pic. 7) consist of a number of plates and chambers into which slurry is pumped and, via a combination of hydraulic pressure, cake washing with evaporation condensate water and air pressure, most of the sugar solution still present within the cloudy filtrate is removed and returned. This goes back into the factory process and the lime ‘cake’ remaining is removed when the hydraulic pressure is released. The cake is broken up in handling and storage and sold as LimeX70 (Pic. 8).

The Cantley factory operates different technology. Rotary filters (Pic. 9) remove sugar solution by washing under vacuum. The remaining thick lime slurry is pumped to storage ponds where much of the water is removed by evaporation. This leaves a final product with about 45% water, known as ‘LimeX45’.
Besides rapidly correcting acidity due to its fine particle size (Table 1), LimeX has other useful benefits as a soil additive. It contains significant amounts of organic matter from the sugar beet e.g. 15% in LimeX70 and 13% in LimeX45, measured on a fresh sample. Additional benefits for crop production come from the phosphorus, magnesium and sulphur contained in LimeX (Table 1).

<table>
<thead>
<tr>
<th>LimeX45</th>
<th>LimeX70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lime as calcium carbonate (CaCO₃) %</td>
<td>40</td>
</tr>
<tr>
<td>Organic matter %</td>
<td>13</td>
</tr>
<tr>
<td>Water %</td>
<td>45</td>
</tr>
<tr>
<td>Minimum neutralising value (as CaO) %</td>
<td>22</td>
</tr>
<tr>
<td>Particle sizes</td>
<td></td>
</tr>
<tr>
<td>&lt; 5 mm %</td>
<td>99</td>
</tr>
<tr>
<td>&lt; 3.35 mm %</td>
<td>97</td>
</tr>
<tr>
<td>&lt; 150 microns %</td>
<td>85</td>
</tr>
<tr>
<td>Phosphorus as P₂O₅ kg/t</td>
<td>7</td>
</tr>
<tr>
<td>Magnesium as MgO kg/t</td>
<td>5</td>
</tr>
<tr>
<td>Sulphur as SO₃ kg/t</td>
<td>4</td>
</tr>
</tbody>
</table>

Further benefits of LimeX products have been shown. For example with carrots and parsnips, often prone to cavity spot, LimeX was useful in reducing damage and increasing saleable production of carrots in 2012 and 2013 (Ref. 3). Other crops showing response are members of the brassica family where LimeX significantly decreases incidence of club root on a range of soil types.

Acknowledgements
We appreciate the co-operation of staff of Cemex Limited, who produce limestone for British Sugar, particularly for allowing us access to their quarry and permission to photograph. We are also grateful to Richard Cogman of British Sugar for advice and help with details of LimeX.

References

SUMMARY
- Lime is essential to the sugar beet industry, both to grower and to processor.
- For the first time in the Review, the origin of limestone used by factories and the part it plays in producing white sugar from beet are outlined.
- The by-product of the sugar extraction process is LimeX70 or LimeX45.
- Analytical details of LimeX and its value to farmers are described.

The need to add lime to acid soils
Calcium is an important plant nutrient for all crops (Ref. 1). Sugar beet is a typical example of this because it must contain at least 0.25% Ca in root dry matter and 1% Ca in tops. If the soil cannot provide sufficient for plant uptake, the element must be applied – most commonly as chalk or limestone (both CaCO₃) or LimeX (mainly an intimate mixture of carbonate (CaCO₃) and a little hydroxide called slaked or hydrated lime (Ca(OH)₂)).

Soil acidity
Apart from its role in providing calcium and the other plant nutrients LimeX plays a vital function in correcting soil acidity over large areas of agricultural land. It is well known that sugar beet and many other arable crops perform well only in soils near the neutral point (pH 7).

Every spring, seedling crops struggling to grow in soil that has a pH around the seedling roots in the low 6s and sometimes in the 5s (see Ref. 1 for details of the pH scale, also the effects of low pH on sugar beet growth).

The target before sowing sugar beet should be to have soil at all depths having a pH no less than 6.5; 7.0 is even better for mineral soils. Organic soils and peats are the only exceptions where pH should be not less than 6.0 but 6.5 is preferred.

Use of LimeX and its value to crops
British Sugar produces, on average, 250,000 t LimeX70 and 50,000 t LimeX45. When there are large national crops such as 2013 and 2014, more limestone is needed in the process. Despite this larger output, its superior qualities as a liming material on arable and grassland soils leads to nearly all of it being used up each year in agricultural applications. With the reduction of sugar beet area in 2015, a shortage of LimeX is envisaged for spreading in 2015/16.

Acknowledgements
We appreciate the co-operation of staff of Cemex Limited, who produce limestone for British Sugar, particularly for allowing us access to their quarry and permission to photograph. We are also grateful to Richard Cogman of British Sugar for advice and help with details of LimeX.

References
Pests and diseases review 2014: old enemies and new challenges make an appearance!

Introduction
After a wet and very mild start to 2014, the sugar beet sowing and emergence period that followed was relatively dry (for some, too dry!) for rapid development of the newly emerging seedlings. The previous kind autumn and winter months had ensured that many pests and diseases survived through to the spring. In addition, the warmer soils at the start of the season favoured the early development and build-up of nematodes and Polymyxa betae, the vector of rhizomania. In this article we review and summarise the threats faced by growers during 2014, including the first case of Stemphylium, and take an early look at the possible issues for 2015.

Aphids and virus yellows
As expected, following the mild winter, the 2014 virus yellows forecast for crops in the absence of any aphid control anticipated very high levels of virus infection by the end of August, ranging from between 50% - 86% of plants becoming infected, depending on drilling date (Table 1). Nationally, over 96% of the crop was protected with an insecticide seed dressing, controlling any virus-carrying aphids feeding on the crop. However, growers whose crops suffered aphid infestations above spray thresholds during the season and who had not used a seed treatment, or who relied on Vydate for early aphid control, would not have had any further aphicide options as there are currently no approved foliar insecticides for peach-potato aphids (Myzus persicae) in sugar beet. In reality, and close to the predicted arrival dates, the first peach-potato aphids were caught in April, with the main peak of activity recorded in late May and early June.

Aphid trapping via the BBRO network of water traps across the four factory areas showed that M.persicae (and some potato aphid: Macrosiphum euphorbiae) were abundant at all sites with a particular hotspot at Fulbourn, Cambridgeshire (as we have seen in previous years). This site was close to oilseed rape crops where large numbers of winged aphids could be found within the canopy. Once again, the resistance tests conducted on individual aphids by Rothamsted Research showed that large numbers of M. persicae contained MACE and/or the super KDR aphicide resistance mechanism(s). However, pirimicarb could be used to control black aphids if they became a problem.

As the season progressed it became clear that there was a plethora of beneficial insects feeding on the aphids. Maintaining these beneficial populations remains important, to provide an integrated pest management strategy and to

Table 1 – Virus Yellows forecast 2014.

<table>
<thead>
<tr>
<th>Factory area</th>
<th>Option</th>
<th>Virus yellows (%) on sowing dates of</th>
<th>Usage of pesticide-treated seeds</th>
<th>Mean temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>15th March</td>
<td>30th March</td>
<td>15th April</td>
</tr>
<tr>
<td>Bury</td>
<td>Without pest management</td>
<td>50.2</td>
<td>62.1</td>
<td>76.5</td>
</tr>
<tr>
<td></td>
<td>With pesticide-treated seeds</td>
<td>1.93</td>
<td>2.20</td>
<td>2.59</td>
</tr>
<tr>
<td>Cantley</td>
<td>Without pest management</td>
<td>53.6</td>
<td>65.5</td>
<td>79.4</td>
</tr>
<tr>
<td></td>
<td>With pesticide-treated seeds</td>
<td>2.20</td>
<td>2.51</td>
<td>2.97</td>
</tr>
<tr>
<td>Wissington</td>
<td>Without pest management</td>
<td>50.2</td>
<td>62.1</td>
<td>76.5</td>
</tr>
<tr>
<td></td>
<td>With pesticide-treated seeds</td>
<td>2.25</td>
<td>2.57</td>
<td>3.05</td>
</tr>
<tr>
<td>Newark</td>
<td>Without pest management</td>
<td>61.6</td>
<td>74.2</td>
<td>86.9</td>
</tr>
<tr>
<td></td>
<td>With pesticide-treated seeds</td>
<td>1.93</td>
<td>2.22</td>
<td>2.65</td>
</tr>
</tbody>
</table>
help protect against other challenges later in the season.

Although large numbers of aphids were caught in the traps, very few wingless progeny were found in the crop during the early stages of growth, reflecting the success and importance of the seed treatments. Consequently, the national level of virus yellows was below one percent, although some fields that had received no protection, displayed classic patches of virus yellowing symptoms in late summer/early autumn (Pic. 1).

**Rhizomania**

Only one new case of rhizomania was identified in 2014 reflecting the 100% use of partially resistant varieties. This case was found in an Rz1 variety in the Orford area and proved to be the aggressive AYPR strain; the warm spring and heavy rain events combined to create conditions favourable for its development.

**Thrips**

Several cases of thrip damage were reported in the early stages of the season. However, the damage was seen only on untreated crops.

**Other soil pests**

Wireworm and millipede damage was reported at several locations in the Wissington and Newark factory areas (Pic. 2), but generally the impact was minimal as the crop was protected by the various seed treatments.

**Leaf miners**

Late leaf miner activity (second and third generations) was of particular concern for some growers, especially around the Wash (Pic. 3). Each female can lay 70-80 eggs and egg hatch is usually between four to six days. Larvae can be active for 15 days. Pupation occurs in the soil and there can be three generations per season (Ref. 1). Control options remain limited and once the larvae have burrowed into the leaves they are difficult to kill. A new BBRO-supported project will start in 2015, in collaboration with ADAS, to re-evaluate the impact and control of leaf miner larvae, particularly the problems caused to the canopy later in the season by the second and third generation larvae.

**Silver Y moth**

Low level Silver Y moth activity was recorded at several of the BBRO monitoring sites. However, no significant caterpillar activity or feeding damage was recorded.

**Spider mites**

Spider mites were observed in East Anglia, particularly in September and October following the relatively warm summer period. Currently, there are no control options available and, therefore, the protection of beneficial insects to predate the mites remains an important control strategy.
High rust pressure in 2014

The summer weather was particularly conducive to rust development, and there were several reports of high levels across all regions from August onwards. Fungicides generally worked well; however, there were occasional reports of fields where rust had continued to develop even after two fungicide sprays. In these fields (receiving a second fungicide), it was possible that the interval between applications had been stretched beyond the BBRO recommendation of four weeks, particularly as fungicide applications began relatively early in 2014.

Further information on BBRO fungicide trials and disease control strategy will be given in the summer edition of the British Sugar Beet Review.

First case of Stemphylium identified in UK beet

The first UK case of Stemphylium was identified in a beet field in Norfolk. This is a new leaf disease that was first identified in the Netherlands in 2007, and is a disease that the BBRO have been watching very closely since that initial identification in mainland Europe. In the Netherlands, its occurrence has grown steadily year on year and it is now found across the country (British Sugar Beet Review Summer 2014).

In 2014, the first Dutch infections were notified on 11th July and it is likely that the UK infection could have been developing for a similar length of time. Symptoms can often be confused with nutrient deficiency because the disease usually starts with small, discrete, irregular yellow spots (0.5-2 mm across) in July-August. The spots begin to die from the centre to form brown spots 1-3 mm across. Heavily infested leaves die and more yellow spots appear on new leaves. Progressive leaf loss follows in August-September with a subsequent yield decrease.

Dutch field trials are in progress to study the control of this disease using a range of fungicides, including products not currently registered for use in sugar beet. Financial losses in field trials by the Dutch research institute (2008-2013) ranged...
from 9% in plots treated with the best fungicide to 51% in untreated plots. Much greater efficacy was seen with products containing the actives boscalid, epoxiconazole or pyraclostrobin, but not all these products are currently registered for use in or widely used in sugar beet in either the Netherlands or the UK. Of the products currently listed on the BBRO disease charts, none have a recommendation for Stemphylium.

2015

So far, the winter has been reasonably kind apart from a short cold snap just after Christmas (with snow particularly for the Newark area) followed by spells of wintery weather in February. Conditions have generally not been cold enough for widespread reduction of aphids or foliar diseases that tend to rely on our maritime climate for survival. This is confirmed in the 2015 Virus Yellows Forecast (Table 2).

It will be important to remove all cleaner-loader/spoil heaps as soon as possible, as they potentially harbour virus-carrying aphids, downy mildew and some foliar diseases that will affect the newly emerging crop.

If Stemphylium leaf spot is suspected in your crop during 2015 please consult your British Sugar area manager or agronomist and, if necessary, send photographs or samples to the BBRO.

Reference


Table 2 – Virus Yellows incidence forecast for 2015/2016 sugar beet crops using mean air temperatures from 1st January to 28th February 2015.

<table>
<thead>
<tr>
<th>Factory area</th>
<th>Option</th>
<th>Virus yellows (%) on sowing dates of</th>
<th>Usage of pesticide-treated seeds</th>
<th>Mean temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>15th March</td>
<td>30th March</td>
<td>15th April</td>
</tr>
<tr>
<td>Bury</td>
<td>Without pest management</td>
<td>9.3</td>
<td>12.7</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>With pesticide-treated seeds</td>
<td>0.42</td>
<td>0.47</td>
<td>0.55</td>
</tr>
<tr>
<td>Cantley</td>
<td>Without pest management</td>
<td>21.8</td>
<td>29.4</td>
<td>42.2</td>
</tr>
<tr>
<td></td>
<td>With pesticide-treated seeds</td>
<td>0.86</td>
<td>0.98</td>
<td>1.15</td>
</tr>
<tr>
<td>Wissington</td>
<td>Without pest management</td>
<td>9.3</td>
<td>12.7</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>With pesticide-treated seeds</td>
<td>0.43</td>
<td>0.49</td>
<td>0.57</td>
</tr>
<tr>
<td>Newark</td>
<td>Without pest management</td>
<td>22.5</td>
<td>32.1</td>
<td>48.2</td>
</tr>
<tr>
<td></td>
<td>With pesticide-treated seeds</td>
<td>0.56</td>
<td>0.63</td>
<td>0.75</td>
</tr>
</tbody>
</table>
Pesticide legislation update

SUMMARY

In the last edition of the Beet Review, I detailed the issues surrounding the future of crop protection, how legislative changes are threatening the UK’s ability to grow wholesome and affordable food, and the NFU’s approach to tackling these issues. The NFU believes that something needs to be done to rationalise the drastic reduction of crop protection products that, until now, have been available for farmers to use in order to grow safe and sustainable food. Since December’s edition there have been numerous developments including two reports published to highlight the issues. The substance of both reports is summarised below along with an update on integrated pest management issues, the NFU’s call to growers to act and the Healthy Harvest campaign.

Andersons report

The NFU and the Crop Protection Association, along with the Agricultural Industries Confederation, commissioned an independent report in October from business consultants Andersons titled, ‘The Effect of the Loss of Plant Protection Products on UK Agriculture and Horticulture and the Wider Economy’. The report focused on all key crops produced in the UK, including sugar beet.

The Andersons report looks at existing legislation, using current reports and evidence on endocrine disruptors, but also considers the losses of active ingredients related to other regulations such as the Water Framework Directive. The aim of the report was to look at the economic impact of plant protection products (PPPs) on UK agriculture and the wider economy. Conclusions from the report show that production of apples, fresh carrots and frozen peas in the UK is under threat as a result of the loss or restricted use of active ingredients in PPPs. The report also concludes that weeds and diseases would become more prevalent in crops, due to loss of active ingredients; this would impact negatively on revenue in all sectors that rely on PPPs, particularly horticulture.

Evaluating the potential impact on sugar beet of the various regulations, the report states that both cyproconazole and epoxiconazole, which are used to control rust and powdery mildew (a disease which can cause up to 20% yield loss in sugar beet) are both likely to be lost. This would leave difenoconazole as the main treatment for sugar beet growers to use. Both cyproconazole and epoxiconazole also control ramularia and cercospora so, according to Andersons, their unavailability would result in yield losses of up to 14%. If these products are removed from the market, sugar beet will be left exposed to diseases and yield losses, which will reduce profitability considerably.

The report does go on to state that, because sugar beet is a non-flowering plant, the authors have assumed that neonicotinoid seed treatments will continue to be allowed. The NFU is monitoring this existing piece of legislation closely to ensure that it is not restrictive to sugar beet seed treatments.

Andersons concluded that the loss of crop protection products will affect all sugar beet production to some degree due to fungal diseases, leatherjackets, cutworms, aphids, moths and slugs (with an average yield loss of 12%). Other pests, as well as volunteer cereals, grassweeds and broadleaved weeds will be less well controlled. In order to maintain yield, Andersons believes that the area of sugar beet grown will increase in order to offset the fact that less sugar per hectare will be produced.

Throughout the agricultural industry, the report highlighted that 44,000 jobs could be lost in the wholesale, supply chain, and wider food and drink trades if active ingredients are taken off the market.

Andersons reported that, out of a total of 40 active substances at high risk, 18 fell into that high risk category due to their having been classified as endocrine disruptors.

AHDB report

The Agricultural Horticulture Development Board (AHDB) report explored the specific threat from the EU review of the definition of endocrine disruptors and its impact on plant protection products, along with the economic factors affected by their potential removal from the market.

Whilst the Andersons report lists the active ingredients that are at high risk of being lost, the AHDB report gives three possible scenarios.

- Scenario one covers the active substances most likely to be lost.
- Scenario two includes the active substances of scenario one, and adds others that are less likely to be lost, depending on the definition of endocrine disruptors that is finally adopted.
- Scenario three covers scenario two and adds all active substances, which might possibly be classified as endocrine disruptors but for which evidence to inform their classification is currently inadequate.

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The AHDB report covers four sectors including sugar beet. AHDB consulted experts from each sector, and the BBRO provided information on the potential impacts on sugar beet if key crop protection products are lost.

The AHDB report concludes that a total of 17 actives are at threat in scenario one: 10 fungicides, 3 herbicides and 4 insecticides. In scenario 2, a loss of an additional 11 fungicides, 7 herbicides and 2 insecticides will be incurred, giving a total of 37. Scenario 3 would see the loss of an additional 10 fungicides, 11 herbicides and 8 insecticides, giving a total of 66 actives lost.

In terms of monetary value, AHDB reported that the total farm gate value of lost production for all sectors would be £8973M per annum. This is made up of £1668M for the edible horticulture sector, £1243M for the ornamental horticulture sector and £6585M for other edible crops such as cereals, oilseeds, pulses, potatoes, sugar beet, hops and vines, and £404M for forestry.

**Updated IPM figures**

The Integrated Pest Management Plan (IPM) helps farmers to demonstrate good environmental practice and sustainability by improving stewardship and helping to convince legislators that crop protection products are used safely and therefore may be retained.

1 million hectares are now covered by the Integrated Pest Management plan under the Voluntary Initiative (figures exclude LEAF plans). This figure shows that farmers take the use of professional pesticides extremely seriously and the plan covers all types and scales of businesses, including smallholders and livestock farmers who use pesticides professionally.

**What the NFU wants in terms of member engagement**

The NFU in its lobbying efforts needs help from its members. If you are affected by any of the legislation concerning plant protection products and endocrine disruptors, it is important that you respond to any relevant consultations. The European Commission launched an online consultation on endocrine disruptors to help define the criteria for endocrine disruptors as required by the plant protection product regulations and the biocidal product regulations. This consultation closed on the 16th January 2015; the NFU and British Sugar submitted a formal response to it, alongside responses from other industry bodies and numerous farmers. It remains important that growers continue to communicate individually on this issue if they meet with their MEPs or MPs in the coming months, to make them aware that this is an issue affecting their constituencies. Information to support growers in making representations to their local politicians is available on the NFU website.

Regulation 1107/2009 on plant protection products also contains a provision to establish, by 14th December 2014, a gradual review of safeners and synergists currently on the market. The first stage of the renewal process saw the first seven active substances successfully renewed. The second stage of renewal has been extended in order to allow time for the process to be completed and so, during the next few months, we will be looking to our members to raise issues with, and put pressure on, their MEPs regarding the review of 1107/2009.

**Healthy Harvest Activity Calendar 2015**

The NFU have a number of regulatory asks for both the UK and Europe for 2015 which include the following:

- **Strand 1 – European Lobbying Activity**
- **Strand 2 – Action with the UK government**
- **Strand 3 – Action with the public/food chain**
- **Strand 4 – Action with COPA/farming unions**

Please check our website http://www.nfuonline.com/home/, twitter @NFUtweets and Facebook for updates regularly and for information on where you can have your say.

**Conclusion**

The NFU believes that a lack of effective crop protection products to control disease and pests is becoming a real problem for growers in the UK. This issue affects not only growers, but the whole supply chain because food safety is put at risk along with productivity, sustainability and loss of jobs.

The Andersons’ report concludes that the losses of indispensable plant protection products will seriously affect a farmer’s capability to grow crops, without any consequential benefits to the environment or human health.

The NFU want to see rigorous scientific evidence considered before any decision is made on classifying endocrine disruptors, and the NFU also wants to see the commission consider a fifth policy option to carry out a full risk assessment.

A reminder of the policy options:

1. No change (this options seems unlikely).
2. Hazard identification alone: this would be the most restrictive and will have greater impact in terms of the number of substances eliminated, as no assessment of the risk is taken into account.
3. Hazard identification within categories based on strength of evidence. This would create a set of categories: endocrine disruptors, suspected endocrine disruptors, and endocrine disruptor active substances. This approach would run the risk of creating grey lists and stigmatising substances for which there is little or no risk, creating political pressure to take regulatory action where none is needed.
4. Hazard identification and characterisation based on potency would focus on the potency of effect and would be a more risk-based approach looking at effects in the context of use.

The NFU would like to see a full risk assessment carried out as part of a fifth policy option because both hazard and exposure should be taken into account when classifying endocrine disruptors. If the decision-making is based on the principle of hazard, this does not acknowledge all scientific evidence and takes no account of the extent or method of use of the products.
A brief history of Roger Warnes Transport

In the world of agricultural bulk haulage there can be few more iconic names than that of Roger Warnes. Barely a mile goes by on the roads of East Anglia without spotting one of the distinctive blue lorries carrying his name.

Roger Warnes Transport Ltd, is a long-established, family owned, bulk haulage business. It started 40 years ago at Great Dunham, Norfolk, where the head office and a third of the 90-strong fleet remain based today. The remainder of the fleet is located at the more recently acquired King’s Lynn depot, which incorporates a VOSA-approved Authorised Testing Facility and tachograph calibration centre. The firm has over 100 employees.

The company grew out of the 160 ha farm at Great Dunham Hall, which was acquired by Roger in 1969. He was later joined in the business by wife Anita and, more recently, sons Tim and Ben.

The fleet consists of a mix of articulated tippers, rigid tippers and articulated walking-floor vehicles. The majority of these vehicles, and all of the storage facilities, comply with the Trade Assurance Scheme for Combinable Crops (TASCC) standards, allowing the assured transport of grain, oilseeds and pulses. Recently the company has been accredited to ISO 9001 (quality), ISO 14001 (environment) and OHSAS 18001 (Health & Safety) certification standards.
Betanal® maxxPro

Better control.
Better yields.
Betanal maxxPro.

Fast, robust, consistent. Nothing protects sugar beet against weeds like Betanal maxxPro. With excellent return on investment, flexible application timing and a range of tank-mix options.

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The company has adapted over the years to meet the changes in the industry and its customers’ needs. Some of the drivers and staff have been with the company for many years and have experienced the steady expansion of the business, which nevertheless still retains its family firm atmosphere.

The transport business cut its teeth on the reliable and cyclical sugar beet season, but grain and fertiliser haulage also became important later on. Today the business also specialises in the distribution of aggregates across the UK and enjoys ‘preferred haulier status’ to the largest mineral supplier in the world, as well as hauling a significant volume of British Sugar’s Topsoil and LimeX co-products.

Anyone who knows Roger will agree that he is an extremely calm person, especially when under pressure and all is not running to plan. He has an almost unique capacity to carry in his head the logistics of a multi-vehicle operation. This can be important at times, such as during the beet delivery season when drivers are reporting in after leaving the factory and need to be told where to go for their next load; he can manage all this whilst working from the seat of a loading shovel.

“I tried to run it from the office one season, but it didn’t seem to work as well,” he commented. Even to this day Roger still does at least five days a week on a loading shovel in the beet season, getting up at 4.00am ready to start work at 5.00am.

Roger’s wife Anita helps with the book keeping and his two sons, Ben and Tim, are heavily involved with the business. Ben works from the office and is responsible for managing the IT systems, including the website, as well as sign writing all of the vehicles. Long-serving transport manager Neville Alderton, together with three traffic planners, completes the head office team, together with fleet engineer Andrew Wall.

Tim drives one of the company’s three ROPA Maus loaders and co-ordinates vehicle movements with his father. Roger was one of the first hauliers in the UK to embrace the concept of ‘Maus’ loaders; “At the time everyone said it would never catch on in the UK”, recalls Roger. Today a significant amount of beet is loaded using this technology.
During the beet campaign there are typically 20 lorries on beet, delivering into all three East Anglian factories, although in recent years sugar beet has assumed less overall importance and now represents only ten per cent of the operation. Aggregate haulage accounts for around 50 per cent of business; grains are about 35 per cent, and the rapidly growing biomass sector’s demand for mulches and woodchip makes up the remainder of the portfolio.

Other activities include warehousing with a capacity of 18,000 tonnes at Dunham, primarily for Trident Feeds and woodchip storage. In June 2010 West Norfolk Lime Ltd was acquired at nearby Hillington, and this now supplies around 20,000 tonnes annually of lump chalk for roadways, cattle yards and sugar beet pads, together with screened lime for the correction of soil acidity.

The business has been recognised on a number of occasions for its customer service and reliability, and Roger was recently awarded a trophy at the 2014 Tip-Ex event at the Majestic Hotel in Harrogate for ‘Personality of the Year’.

Roger, himself a former F1 stock car racer, has, for the past five years, sponsored the King’s Lynn Stars speedway team through his long involvement with the sport. Son Tim has a competitive involvement on the track, which has included racing motocross both at home and in Europe.

Acknowledgement
The author is grateful to the Warnes family for their assistance in the production of this article and for supplying the images.
A developing sector, turned towards export

The Thai sugar cane industry has been self-sufficient since 1960. It began to develop under the impulse of private groups and then, in 1984, the first public management took place, followed during the 1990s by 5-year plans aimed at directing the crop towards export, particularly to the neighbouring countries, which all had a sugar shortage.

On average, between 1990 and today, production has increased by 7% per year: reaching over 10 Mt of sugar in 2011 and over 100 Mt of cane processed during the 2013-14 campaign (for a sugar production of 11.3 Mt).

Over the same period, consumption ‘only’ increased by 4% per year, to reach about 2.50 Mt during the 2013-14 campaign. Since 2006, the export volume has multiplied by 3.4 and now exceeds 8 Mt, making Thailand the world’s second leading exporter: of course still far behind Brazil, but with an export volume two or three times higher than its other rivals.

Almost all of its clients are within its geographic area: less than 8% of the sugar exported from Thailand left Asia in 2012. It is worth underlining that over half the sugar leaving Thailand is in the raw form (one third of which goes to Indonesia) However, an increasing amount of the sugar exported (over 3 Mt) is in white form.

The development of port capacities was carried out simultaneously and the annual potential for export is estimated at 11 Mt.

Production based on 300,000 growers and 50 factories

With an average farm size of 7 hectares, almost all sugar cane is cultivated by independent growers, of whom nearly 40% are in the Northeast region. One of the great achievements of the Thai expansion process was that it managed to keep independent growers (300,000 in 2013-14) farming 1.5 Mha.

A very small area is irrigated (about 10%) and most of the cane is still burned before being harvested by hand (despite a bonus/malus system implemented via the industry) before being delivered to the mills by the growers.

The cane cycle is usually over 3-4 years, except in the Northeast region where half the cane is planted every year. Yields are...
Sharing value

Thai sugar production costs are estimated to be similar to those in Brazil. Although industry pays a fairly high price for cane, the income from bagasse (cogeneration) and molasses (ethanol) mean that representatives from the sector can reasonably consider that it can durably sell onto the world market from a raw sugar price (NY#11) of 17.50cts/lb.

The value of sugar and molasses from cane is shared amongst the growers (70%) and millers (30%) – the latter remaining the owner of the bagasse.

An initial payment, fixed by the government, is paid to the growers at the beginning of the campaign: the initial cane price. After the harvest, the millers adjust this to obtain the final payment amount. However if the initial forecast made by government has been too optimistic, the State refunds the millers, not the growers; this has happened on two occasions over the last 20 years.

Three quotas

The sector is governed by a quota system:

- The first (‘A quota’, at 2.5Mt in 2013-14, or about 20% of production) corresponds to domestic demand and is sold to approved wholesalers at a minimum price which has been constant since 2008, and which aims to guarantee a minimum quantity of sugar in the country even if the world market is more attractive.
- The second (0.8 Mt), is exported via sugar brokers acting on behalf of the State; this allows the State to know the sugar price on the world market and calculate the value owed to the growers.
- The third is exported by licensed exporting companies at a free price but which must guarantee that growers receive the value received from the sales under the previous quota.

Guidance fund

Finally, the millers must contribute 5 Baht/kg of ‘A quota’ sales to a national guidance fund, the ‘Cane and Sugar Fund’. Added to this amount is the VAT rate (7%) applicable to this sugar. This fund can then be used for production guidance. In 2013-14, an amount of 160 Baht/t cane was paid back to the growers.

There are some hints of reform, particularly with the liberalisation of the ASEAN (Association of South East Asian Nations) market envisaged for 2015. This opening is nevertheless widely viewed as an opportunity to guarantee Thai sugar the leadership on these markets, which all have a sugar shortage.

A highly regulated sector

The founder law of 1984 continues to regulate the sugar sector and allows it to be managed by three levers: sharing the cane value, a quota system aimed at keeping part of the sugar for local consumption, and a guidance fund paid into by the professionals.

From rice to cane...

Reform of the rice policy should enable the sugar sector to continue its surge.

This policy, which was extremely costly but incapable of making Thai rice competitive, has been severely criticised...
Towards a sugar-energy sector

Alongside this agricultural policy, a highly pro-active energy policy is under way. The government aim is to achieve 25% of renewable energies by 2021, compared with just under 10% today. Amongst these renewable energies, ethanol and electricity from bagasse will have a large share.

Cogeneration

To achieve this objective, the government is working on the purchase of electricity from the methanisation of bagasse at a preferential rate, which is of particular interest to the millers because the inherent revenue is not shared with the growers. Cogeneration is a current priority in industrial investment.

Ethanol

Currently, to produce ethanol from sugar cane, the passage via molasses is compulsory: in order to guarantee the sharing of the cane value between grower and miller, the government prohibits (apart from exceptions) the direct processing of cane juice into ethanol. Nevertheless, taking account of demand and government ambitions, this legislation could be subject to review.

Whereas in 2013, Thailand’s daily ethanol consumption was 2.6 ML, government is targeting 9 ML by 2023, solely of national origin.

To achieve this objective the ethanol tariff is established within a framework and E85 is granted tax incentives. In addition, in January 2013, government quite simply prohibited the sale of fuel without ethanol and now envisages the prohibition in the medium term of E10 to make E20 the norm.

Following the Brazilian model, the Thai sugar sector will therefore soon convert into what could be called one of the most accomplished sugar-energy sectors.

Perspectives

Less recent than it may appear, but now very pro-active, the Thai cane sector still does not seem to have reached its zenith, particularly considering it is at the heart of the geographic area where a significant share of future world demand is concentrated. The ambitions of ASEAN to reduce customs duties by 2015, the development of Chinese consumption, the desire to make this sector a renewable energy supplier and the necessary reconversion of rice farmers will all be drivers for dynamism in Thailand.

Thailand’s determination to increase its production by 80% within 10 to 15 years, is extremely ambitious, but must be considered in the light of the indicated expansion of ethanol and an energy policy favourable to the sector.

Who would have said, 10 years ago, that Thailand would become the world’s second leading exporter and the cradle of two of the world’s largest sugar companies?
CONTRA
Multi-Resistant Oil Radish

- Level 1 BCN control
- Late flowering
  - extended vegetative growth
- Deep & intensive rooting system
- Wide sowing window
- Rapid establishment
- Reduces soil erosion
- Excellent weed suppression
- Strong biofumigant properties
- Easy to manage
- Nematode multi-resistance
- Disease multi-resistance

A Step Forward in Variety Performance
Factories in record breaking run

After a great start last year, all factories have put in record breaking performances and we’re on course to process 9.3 million tonnes of sugar beet and extract over 1.43 million tonnes of sugar.

More than 53,000 tonnes of beet were processed on 74 days this campaign, over 55,000 tonnes on 19 days and a new landmark of over 56,000 tonnes on six days. These records reflect the reliability of all four sites, with the Manufacturing Reliability Programme really paying dividends. The S&OP (Sales and Operations Planning) process has delivered excellent results, which means the factories could process this crop by the middle of March and superb drier performance has helped all sites maintain the best overall ‘4 site’ delivery to date.

Food safety, quality and environmental performance have also been excellent across the sites, with sugar quality KPI registering greater than the 90% average. We’ve had a few hiccups in terms of health and safety, but this continues to be a key area for improvement.

Here are some of the highlights from across the four sites.

**Bury St. Edmunds**

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<td>Beet processed:</td>
<td>2.5 m tonnes</td>
<td>2.2 m tonnes</td>
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<tr>
<td>Sugar extracted:</td>
<td>369,000 tonnes</td>
<td>335,000 tonnes</td>
</tr>
<tr>
<td>Length of campaign:</td>
<td>172 days</td>
<td>157.5 days</td>
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The new £6.9 million filter station and purification system have truly delivered and helped eliminate the site’s main source of lost production. The only real blip was the failure of the Tower 3 diffuser screens which slowed the factory down to 10,000 tonnes a day during the five day repair, but the factory quickly recovered afterwards.

**Cantley**

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<th>2014/15</th>
<th>2013/14</th>
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<tr>
<td>Beet processed:</td>
<td>1.6 m tonnes</td>
<td>1.33 m tonnes</td>
</tr>
<tr>
<td>Sugar extracted:</td>
<td>268,000 tonnes</td>
<td>223,123 tonnes</td>
</tr>
<tr>
<td>Length of campaign:</td>
<td>172 days</td>
<td>157.6 days</td>
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Newark is maintaining its excellent safety record of zero lost time injuries. The sugar end performance has been unlocked by some great Continuous Improvement (CI) work, alongside the white cent BMA capital investment. This, with the support of the Wissington refinery, has allowed the beet end to deliver to its potential, without overfilling juice tanks.

**Wissington**

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<th>2014/15</th>
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<tr>
<td>Beet processed:</td>
<td>3.3 m tonnes*</td>
<td>3.1 m tonnes</td>
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<tr>
<td>Sugar extracted:</td>
<td>519,000 tonnes*</td>
<td>505,915 tonnes</td>
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<tr>
<td>Length of campaign:</td>
<td>181 days*</td>
<td>178.4 day*</td>
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*estimated

A superb CI team effort has mitigated previous site water storage constraints, as well as successfully eliminating sugar in condensate water through an essential replacement capital investment in the evaporator station.

Wissington has truly supported the ‘4 site’ plan by processing juice from Bury St Edmunds, Cantley and Newark through its refinery. The Phoenix and Bioethanol plants have posted multiple throughput performance records, enabling possible syrup storage constraints to be mitigated. The Phoenix plant performance tops an average of 600 tonnes per day of low green and the Ethanol plant has been making more than 210KL of product a day for the first time.
Summer Open Days 2015

Invitation

The BBRO Open Days provide technical information and advice from the very latest research findings to help you get the most from your sugar beet crop.

In addition to the technical presentations in the field, each event will feature a large number of trade exhibits and the opportunity to meet with a range of industry experts.

There is a no charge for attending any of these events, and BASIS and MReSO points will be available on each day, as well as food and refreshments.

Tuesday, 12th May 2015

WISSINGTON
Grimston, King’s Lynn, Norfolk

Thursday, 14th May 2015

NEWARK
Bracebridge Heath, Lincoln, Lincolnshire

Tuesday, 19th May 2015

CANTLEY
Salhouse, Norwich, Norfolk

Thursday, 21st May 2015

BURY
Ixworth Thorpe, Bury St. Edmunds, Suffolk
BBRO update

Time certainly flies, we are coming to the end of February, the BBRO Conference has been and gone with great speakers and a very engaging poster session. Planning and preparation for the 2015 trials is well underway. This update will now become a regular feature of the British Sugar Beet Review, designed to give the grower base and industry a transparent view into the continuous developments of the BBRO trials and future crops.

Looking forward

We are currently working on machinery preparation, trial protocols, seed preparation and trial site plans. These are a selection of the high priority jobs that are currently being organised before the commencement of trial drilling. From preparing the bespoke Wintersteiger plot drill to organising plot marking canes and labels, each part of the preparation is meticulously planned and executed to ensure accuracy and success. The team will establish that all machinery is ready and fit for purpose when required. As part of this we will take delivery of two hired John Deere 6125 tractors fully equipped with satellite guidance to deliver the most accurate drilling, therefore delivering efficiency and successful trials.

Careful monitoring of the sites with the host growers is key to the success of the trials before and throughout the growing season. For 2015 the BBRO will have 13 field trial sites across the sugar beet growing area of which four of these sites will host the 2015 Open Days:

- Wissington Area Open Day at Grimston, King’s Lynn, Norfolk. 12th May.
- Newark Area Open Day at Bracebridge, Lincolnshire. 14th May.
- Cantley Area Open Day at Salhouse, Norfolk. 19th May.
- Bury St. Edmunds Area Open Day at Ixworth Thorpe, Suffolk. 21st May.

To facilitate knowledge transfer the Open Day sites will double up as BBRO demo sites which will enable British Sugar area managers to organise visits of grower groups. These can be arranged with your area manager at various points in the growing season. This offers growers and other professionals involved in the industry the chance to gather technical information, discuss the latest agronomic topics, review current findings and offers platforms to discuss future ideas. The Open Day/demo sites are an exciting addition for us and will lead to many days of hard work to ensure they are always looking as they should – perfect!

2015 BBRO Winter Conference

The BBRO team were involved alongside the British Sugar Agriculture Communications team with preparation for the Winter Conference. On the day we were talking to delegates in the poster session and giving information on trials operations with a well prepared information video. The video showed both time-lapse and actual time footage of harvesting 2014 trials at various locations. Also shown was an informative video of Best Practice of harvest and storage presented by Colin Walters.

Trials nearing completion

The 2014 clamping trials are still ongoing and will finish in line with the end of the sugar beet campaign. This is the third year of gathering information regarding long-term storage. The 2014 clamping trials have concentrated on gathering information on Maus clamps and another good set of data has been generated. In the 2014 season we constructed four long-term Maus storage trials.

Future

I am looking forward to beginning the 2015 trial season with my keen and professional trials team. We are always looking for feedback from the industry. Please contact me or any member of the BBRO regarding any aspect of trials and future ideas. Look for updates and follow us on Twitter @BBRO_Beet.

I also would like to thank all of our trial hosts for a very successful 2014. Without the host growers there would be no trial development.

Daniel Godsmark, BBRO Trials Manager
daniel.godsmark@bbro.co.uk
Farmers urged to register for BPS

The NFU is urging farmers and growers to ensure they have registered for the new system to claim farm payments in good time.

Although more than 22,500 farm businesses have registered, the NFU says it is vital that more people take time out to familiarise themselves with the new system, register and start the process of making their first Basic Payment Scheme (BPS) claim.

Senior BPS adviser Richard Wordsworth said: “Working with the Rural Payments Agency (RPA), the NFU has emailed and texted members in the recent weeks urging them to register so that they can in turn start the process of building up their first BPS claim.

“All those wishing to claim BPS need to register and that includes those that have already registered for Single Payment Scheme (SPS) Online or for that matter used an agent to help with SPS last year.

Further functionality will be going live in the coming weeks, but do not delay the registration process.

Important information for claimants:

- To be eligible for BPS, a claimant must have at least five entitlements and five hectares of eligible land – known as the ‘minimum claim size’. If a claimant has less than five entitlements and wants to transfer out their entitlements to another farmer, they also need to be registered on the new rural payments online service, as this service will be the only way to transfer entitlements before 15 May for another farmer to use them for BPS 2015.

- If a farmer has not yet registered, the first step is to go through security by proving who they are. This can be done by calling the Rural Payments helpline on 03000 200 301. This line is open Monday to Friday, 7am-6pm, except Bank holidays, and Saturday and Sunday from 8am-2pm. Claimants must ensure they have their SPS information to hand as it will help to answer registration security questions posed by the RPA. They will also need to have a password and an email account ready to use. The registration process must be completed within 12 hours of the phone call by logging onto the rural payments website (www.gov.uk/rural-payments) where contact and land details can be checked and claimants can give others permissions to access claim data for those who may be submitting the final claim on their behalf.

Agrovista UK Ltd appoints new Managing Director

Chris Clayton has been appointed Managing Director of Agrovista UK Ltd, one of the leading UK agronomy and supply companies, from 1st March.

Chris will join from Syngenta’s integrated crop protection and seeds business where he was Head of Central Europe for the business.

Before this he held various marketing and operational roles within Syngenta, including Country Head for Hungary and the UK business’s Head of Sales and Marketing.

Chris is a graduate of Newcastle University with a BSc in Agriculture. His early career started with ICI Agrochemicals, where he spent five years in sales in Central Southern England.

Commenting on the appointment, James Robertson, Group Chairman said that “Chris’s experience and knowledge of Agrochemicals, seed and European markets matches Agrovista’s development plans perfectly. As a division of the Marubeni Corporation, our aim is to capitalise on the wider business’s other activities. For example, Marubeni is the second largest grain shipper in the world with a substantial fertiliser activity; both these areas present huge opportunities for the growth of Agrovista’s UK business.”

Commenting on the announcement of his appointment, Chris outlined that he is planning on taking Agrovista into its next phase of growth and success, building on the strong culture already existing in the business. “This will come from leveraging the outstanding technical knowledge within the team, coupled with the market-renowned development work being generated from the Agrovista R&D platform. We also have some very strong relationships with progressive key suppliers, which when linked to the rapid developments in the agricultural market will bring many exciting new solutions to growers all over the UK.

If you think someone in your neighbourhood may need help in building their claim online, then do urge them to get in touch with the Rural Payments helpline to discuss what help is available. The RPA has set up 50 support centres across England where farmers can get one-to-one, face-to-face help, but to access them the RPA needs to be called first.
With the end of the beet campaign 2014/15 approaching one thing is clear: HOLMER revolutionises lifting once again! A day of lifting beet can be long and demanding. The driver is expected to pay attention to many different settings and operations at once, and to do so while the machine is running at high output and in changing soil conditions. The driver must keep an eye on all kinds of different parameters including the depth guide of the individual share bodies, which in the HR lifter can be set independently.

HOLMER EasyLift
The new easy system for beet lifting

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The new HOLMER EasyLift ensures the burden on the driver is eased considerably. It guides the depth of the individual share bodies automatically, so that each individual beet can be lifted at the optimum depth. The on-board computer of the EasyLift uses measured position values to calculate the height of the beet crown. This automatically enables the full potential of the HR lifter to be utilised reliably and with continuously uniform output.

The automatic depth guiding by the HOLMER EasyLift with optimum working depth ensures that breakage losses and damage to the beet caused by an incorrect working depth are things of the past. Unnecessarily deep lifting is also avoided: Lifting 1 cm too deep results in approx. 100 t/ha unnecessary earth movement, accompanied by higher wear and fuel consumption – and deductions at the sugar factory.

Therefore, with the HOLMER EasyLift not only can you save on outgoing costs, but the burden on the driver is relieved considerably, whether when dealing with different variety-related beet shapes, weather and location-dependent soil conditions, intermittent stocks to harvest, yield fluctuations, ruts or unevenness at the edge of the field. The new ease of lifting from HOLMER has now been confirmed by enthusiastic test drivers this season!

For additional information, please contact Matt Carse,
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Agrifac UK Ltd, 4 Thorby Avenue, March, Cambridgeshire, PE15 0AZ
Stealth in the beet field

Paul Rhodes has driven beet harvesters since 1992, including most of the major brands.

He has two objectives: “The quality of the harvesting is paramount to guarantee repeat contracts next year... and I like to get home each night in reasonable physical condition!”

Glanford Beet Ltd of Hibaldstow, near Brigg, Lincolnshire lift up to 2500 acres of beet between Barton on Humber, Gainsborough, Grimsby and Lincoln. They are the first contractor to operate ROPA’s two axle Panther beet harvester and happily Paul is achieving both his objectives!

“I have wanted a ROPA for some time but our acreage could not justify a three axle Tiger so the Panther has been a welcome option. We spent three days at the German factory getting familiar with the controls and within the first day of lifting I had settled into them.

“After sales support is a major concern for beet harvester operators and CTM’s has been fantastic. Late one day we had a small problem with AdBlue. Adrian Mountain, their Service Manager, came out straight away and worked into the late hours. At 1.30 am we were lifting again!”

“The Panther is engineered very, very well” says Paul “as you would expect from a German harvester. Turning is fantastic. Thanks to its articulated design it can practically turn within its own length, easily coping with 30ft headlands. The auto levelling and slope compensation copes well with the steep gradients of the Lincolnshire Wolds”.

“The self-steering and row guidance works well and I can clearly see the sheers from my cab thanks to LED lighting across the full width of the lifter. The sheers themselves are automatically kept at a constant distance from lifting rollers and maintain good depth control even in hard soil conditions. The tungsten coated knives are kept clear of the ground at all times so wear is minimal and scalping is consistently good. I can see from my monitor that the beet is handled well by the turbines and I can vary the turbine speed and gate height as I go along to suit conditions”.

“We were able to start work early in hard soil conditions thanks to the pressure I can apply to the individual shares, keeping them in the ground. Each is stone protected.”

Paul particularly appreciates the positioning of the discharge elevator, well forward on the 28 m³ tank which means less turning in his seat and saves him a crick in his neck! The tank itself is fitted with ultrasound sensors front and back to ensure even distribution. On the subject of physical well-being Paul is also appreciative of the cab’s very effective soundproofing.

Ground compaction is always a sensitive subject for the growers and the Panther has been designed for good weight distribution and traction in all conditions, aided by the latest Michelin Ultraflex tyres, front and rear which can be run at lower bar for lower ground pressure and a larger footprint. By ‘crabbing’ down the field, the following wheels avoid the wheelings of the lead wheels.

Weight distribution is a major design feature and gives near 50/50 front and rear distribution when the beet tank is full, reducing strain and pressure on the axles and land.

Winner of the BBRO prize draw

At the BBRO Winter Conference on 10th March 2015, entries were collected from all delegates entering the venue as part of a competition to win an iPad mini. Following the event a draw was made and the winner was announced as Stephanie Garner of Wisbech (pictured left). The prize was presented to Stephanie by British Sugar area manager Stephen Woodley (pictured right) on Friday 6th March.
Campaign 2014/15 – Crop/Factory update

We expect to complete this year’s campaign during early March and Bury will be the first factory to finish processing this year. The crop yield this year has been quite exceptional despite the very challenging seedbeds at the start of the season. Bury will have sliced more beet this year than ever before; we estimate the volume to be over 2.36 MT. The factory has also achieved several throughput records this campaign including a new daily slice throughput of just under 16,000 tonnes per day and a campaign throughput record of approx. 14,500 tonnes per day. Mechanically the factory has had an excellent performance throughout the season.

Root samples taken in August and September indicated that the 2014/2015 yield would be good following an excellent growing season. As the campaign progressed growers increasingly found some extraordinary yields being harvested across the Bury area. Some fields and contracts have delivered well over 100 tonnes/ha and the high levels of late season growth have been great news for growers in terms of crop returns. The 2014/15 Bury crop has been the highest yielding ever at just under 80 t/ha.

The Bury soil sampling team will shortly be starting this season’s testing. We offer the following range of services; pH testing, nutrient analysis, beet cyst nematode and now ‘free-living’ nematode tests. With the continued pressure on farm input’s including fertiliser costs and also the cross compliance requirements this service is a must for growers. Our own LimeX70 product is ideal for both pH correction and it also has additional nutrient value. Please contact your area manager if you would like to discuss your soil testing requirements and the fertiliser value in our LimeX products. There is still some availability from our Bury site so please order soon to keep secure your requirements.

BBRO Open Day

The Bury Factory BBRO Summer Open Day will be held on Thursday 21st May at Ixworth Thorpe. More details will be available through the BBRO. The day includes discussions on the latest agronomy techniques for maximising crop yield and working toward the BBRO 4x4 initiative.

Having now settled into my new position at Bury I am really looking forward to working with you all in the future and would like to wish all growers a successful season for 2015-16.

Mark Culloden
Head of Agriculture

The 2014/15 campaign at Cantley Factory started on Wednesday 17th September and the estimated finish date will be within the week commencing 2nd March 2015. Factory throughput to date has been noteworthy. The factory broke the daily slice record five times this season and peaked at 10,516 tonnes; the weekly slice record was broken twice with the new target set at almost 72,000 tonnes and we have achieved 68 days of 10,000 tonnes slice or above. The factory had only achieved 55 days total of over 10,000 tonnes slice in previous years. Beet quality has remained consistently good throughout the season which has assisted in achieving these excellent results.

Once the campaign is over the factory will start its off season maintenance program which will include:

■ Start of the factory control system upgrade.
■ Full commissioning of the thick juice import/export system.
■ Overhaul of the animal feed driers.
■ Beet end tank and sugar end remelt tank replacement.

Current finished growers are averaging over 88t of adjusted beet/ha which is a 12% increase in the previous record yield of 2011/12. Given the relatively difficult drilling conditions at the start of the season these results are truly remarkable and demonstrate how resilient the crop can be. Ensure that you give next year’s crop every chance of achieving the same results as this year by having your drill serviced/tested and following the BBRO’s seed rate recommendations of 1.25 units/ha to achieve a plant stand of 100,000/ha.

Please make sure you have made arrangements for soil testing for next year’s crops. Cantley offer a full pH, nutrient, beet cyst nematode and free-living nematode testing service. Please contact your area manager to book your fields in for testing and also to order LimeX.

Preparation for the Cantley BBRO Open Day at Salhouse, near Wroxham on 19th May is well under way. The Cantley Agricultural Team hopes you will be able to attend this event and look forward to meeting many of you on the day. Please make a note in your diary.

Finally, I would like to say how excited I am to be at Cantley and would like to thank all growers and hauliers for growing and delivering a record crop at Cantley this year. I look forward to meeting you and wish you all a successful 2015 season.

Andrew Dear
Agricultural Business Manager
NEWARK FACTORY

The 2014/15 campaign is progressing well, and after 157 days we're currently averaging 10,073 tonnes of beet sliced per day at time of writing. So far we are proud to have achieved a number of record breaking days:

- Start-up beet sliced in first 10 days – over 102,000t
- Daily campaign crystal production – 1,198t on the 20th November 2014
- Daily beet sliced – 11,508t on the 29th September 2014
- Weekly campaign crystal production – 7,573t for the week ending 10th November 2014
- Weekly beet sliced – 76,701t for the week ending 29th September 2014

Newark factory is hoping to convert these into campaign records in what could also be our longest ever campaign of 186 days. There are always some more significant operational challenges during any campaign and one of note this season was a fairly significant fire on the 14th December 2014 which caused damage to some plant in the animal feed end of the factory. There was also a beet screen failure requiring a 12 hour shut down repair on the 6th January 2015.

The crop also looks to be having a record breaking campaign and we should finish with a delivered yield of around 75 t/ha at Newark, 4% more than was delivered in our previous record campaign of 2011/12. This will be a remarkable achievement for the whole industry, particularly considering the wet winter and dry spring compromising seedbeds and drilling dates which delayed establishment on many farms. We finally got some rain in May but summer rainfall was well below average with only 4 mm of rain measured at Newark in September which will certainly have restricted growth.

Nick Morris
Agricultural Business Manager

WISSINGTON FACTORY

Campaign 2014/15 – Crop/Factory update

The processing campaign has been completed at just over 180 days with an average throughput over 18,000 tonnes sliced per day. This has been excellent and consistent factory performance considering the size of crop this year. Generally the factory performance is measured using ‘how much slice per day’ but it is a sugar factory and how the refined sugar is processed and handled is a more important factor.

When it was apparent how large the 2014/15 crop was going to be prior to the start of the campaign plans were put in place to keep sugar flowing out from the factory to allow factories to run as fast as possible for as long as possible. Very difficult trading conditions for sugar in the EU made these plans even more important.

Sugar content has been lower than average this year, but has been compensated for by increased root weight. The later lifted crops have been surprising in terms of how high the yields have been and clearly have benefitted from a generally mild winter. Many fields, which did not look anything special earlier in the season have now yielded over 90 t/ha adjusted yield and some over 100 t/ha. Higher plant populations this year have been a significant factor to this increased yield. The average yield for Wissington this year will be just under 78 adjusted tonnes/hectare. Average sugar content will be around 16.9% giving a sugar yield of around 12 t/ha.

Factory improvement projects

Two main projects are planned for the factory this coming Summer.

- An expansion of the bioethanol plant which will involve the construction of an additional fermenter and associated support systems in the plant.
- The second project will be part of a multi-year project to upgrade the control system of the factory which is essentially the ‘brain’ of factory.

Wissington agriculture team update

I am delighted that Stephen Woodley has successfully completed the British Sugar Agriculture Graduate Scheme and has assumed the role of area manager in the west of the Wissington beet growing area. This is my first Factory Update for Wissington having been relocated from Bury factory in December. It is a privilege for me to be at Wissington and I aim to meet many growers in the future months.

Dan Downs
Head of Agriculture
Sugar beet yields plateauing?... Rhizomania can still restrict yields.
For the strongest protection insist on double rhizo resistance – Rz1 + Rz2.
Data Source: BBRO Sugar Beet Recommended List 2015