Not to put too fine a point on it, Stingray is the highest yielding variety available on the 2014 BBRO Recommended List.*

An excellent pedigree with lower bolting, it is the variety others look up to.

*Source – BBRO 2014 recommended list - Full data set at www.bbro.co.uk
The British Sugar Beet Review is published quarterly in March (spring),June (summer), September (autumn) and December (winter). It is sent to all sugar beet growers in the UK and is funded jointly by growers and British Sugar plc as part of the British Beet Research Organisation education programme. Neither the editor, nor British Sugar plc, is necessarily in agreement with opinions expressed in this journal. No responsibility is accepted for statements contained in advertisements. © Copyright is by permission of the editor and charges may be applicable. Published images are copyright of this journal unless stated otherwise.

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BRITISH SUGAR

Published jointly by British Sugar plc & The British Beet Research Organisation

Weed beet – by the scruff of its neck!
Nick Morris reviews control strategies for weed beet and uses one grower case study to illustrate the principles behind getting to grips with this pernicious agronomic problem.

Neonicotinoid insecticides – a review of their contribution to the sugar beet crop
Steve Foster and Alan Dewar look back at the evolution of this chemical grouping and chart the benefits they have brought in terms of reduced pesticide loading and efficient pest control.

BBRO Plant Clinic: 2013
Gillian Champion reviews the activities of this valuable industry resource and lists the range of crop ailments which were seen this year and the advice given to growers and advisers as a result.

From field to film
Philip Ecclestone gives us an insight into an unusual diversification project which one Rutland beet grower has grown into an internationally recognised business.

The Norfolk Farm Machinery Club
Chris Thomas of ‘NORMAC’ explains the long history of this well-known and respected farming organisation and showcases some of its most recent achievements.
editorial

Late growth spurt boosts final outcome for 2013 crop...

The 2013 beet crop promises to finish on a ‘high’ following favourable autumn weather, which has allowed the crop to grow on late into the season. Many growers have already harvested above average yields, a few of which have topped the magic 100 tonnes per hectare mark.

Harvesting conditions have for the main part been good, with rainfall receipts reducing in the run up to Christmas. The crop canopy has again remained generally healthy, given the comprehensive fungicide programmes now pursued by the majority of growers. With beet going into longer-term store under dry conditions, keeping quality should be good provided clamps are adequately managed until out-loading and delivery.

The winter issue of the British Sugar Beet Review focuses on BBRO projects and the work of the plant clinic, together with a report on the outcome of investigations into seed emergence issues last spring. Ruth Digby explains the basis of the NFU frost insurance policy, which has been updated for 2013/14.

Mark Stevens gives an account of the recent IIRB study tour to North America and Philip Ecclestone provides a timely reminder about the importance of drill performance. Steve Foster and Alan Dewar provide an account of the contribution that neonicotinoid insecticides have made to the sugar beet crop, not only providing unrivalled protection from a broad range of pests, but also facilitating a huge reduction in pesticide loading on the environment.

I hope you enjoy this, the final issue of the Review in 2013 and on behalf of the editorial committee may I wish you a happy and peaceful Christmas and a prosperous beet crop in 2014.

Robin Limb – Editor

2014 BBRO Events Programme

BBRO Winter Conference
Tuesday 4th February 2014, Peterborough

BBRO Summer Open Days
Wissington
Tuesday 13th May 2014, West Dereham

Cantley
Thursday 15th May 2014, Colby

Newark
Tuesday 20th May 2014, Bracebridge Heath

Bury St Edmunds
Thursday 22nd May 2014, Stowmarket
During 2013 the BBRO Research and Development Board commissioned a review of crop production research requirements by Dr. Debbie Sparkes. As a result of this review three key research projects have been approved and will start next year. These are outlined below but an article that outlines the recommendations of the review in more detail will be published in the next edition of the British Sugar Beet Review.

The BBRO also reviewed all existing projects at our board meeting in September and have developed a priority matrix which will be used to evaluate all the research work we commission. A full outline of our current programme of work is available on our website.

In an effort to ensure we have good quality output from the work we commission, we have also made some changes to the way the projects are overseen. We have identified the need for a mentor role. Mentors will focus on working with the project leaders to ensure that the work is well formed, properly delivered and given maximum opportunity to succeed.

**Understanding plant/soil interactions to improve sugar beet productivity and sustainability**

(This project is a collaboration between the University of Nottingham and BBRO.)

The recent BBRO-funded review of sugar beet research requirements identified a number of priorities in relation to soil-plant interactions. This work will address three of those areas:

1. **Evaluating and mitigating limitations to water uptake**
   Water availability is the most important limitation to sugar beet yield in England with an average yield loss to drought of 10.5%. This component of the project will use X-ray CT techniques to identify constraints to water uptake by the sugar beet crop. Once those constraints have been identified, field experiments will explore strategies to mitigate them, thereby increasing water availability for crop growth and increasing yield.

2. **Identifying rooting traits for optimal nutrient uptake**
   Work in Italy has demonstrated great diversity in rooting traits within sugar beet germplasm and positive relationships between root elongation rate and root yield. This project will evaluate the diversity in rooting traits in UK and European germplasm and explore relationships between rooting traits and nutrient uptake. The aim is to develop a rapid rooting screen for nutrient-uptake efficiency. Allied to this work, and informed by the root morphology associated with good nutrient uptake, will be field experiments to evaluate nutrient placement techniques.

3. **Improving establishment and early growth**
   Achieving a uniform sugar beet population of 80,000 plants per hectare is required to optimise resource capture and yield. However, establishment can vary greatly from 20-90% and is difficult for growers to predict. This project will investigate soil physical properties at drilling (e.g. aggregate size, bulk density, shear vane strength, moisture content) and their relationship with emergence rate and final plant population. Through a field survey across a wide range of soil types, a model will be developed that uses soil physical properties, plus environmental information (e.g. soil texture, temperature), to predict establishment. The model will be validated across soil types and seasons before being used to develop a tool, that growers can use in-field, to predict establishment rate based on seedbed quality. The tool will facilitate grower decision-making regarding the required seed rate or whether to improve establishment by, for example, waiting for temperatures to increase or carrying out additional cultivations.

Dr. Sparkes is also carrying out a review of the crop protection research for which the findings will be presented back to the BBRO R&D board in December 2013.

**A review of strip tillage for sugar beet production – a desk study**

The objective to this proposed project is to produce a review to better understand how strip tillage is currently being used in sugar beet in the United Kingdom (UK) and across Europe.
This desk study will serve to identify key areas for future research and develop further the guidelines for the use of strip tillage for beet production in the UK.

Strip tillage is increasingly being used for wide-row crops such as sugar beet, maize and oilseed rape in a number of geographical regions of the world including North America, New Zealand and Europe. Strip tillage has been shown to offer many benefits both economically and environmentally (by reducing soil and wind erosion through crop residue retention). Data suggests that this can more than halve the fuel usage associated with crop establishment (compared to plough-based systems), lower broad-leaved weed burdens (through reduced soil disturbance between rows) and also reduce labour costs and the number of field operations. In addition studies in the United States, Canada and the UK (BBRO project 07/25) have demonstrated strip tillage increases work rates with fewer field operations and, in some circumstances, can offer improved margins compared to plough tillage.

It is envisaged that the outcomes of this research would improve the current understanding for the potential use of strip tillage in sustainable sugar beet production in the UK. Outputs from this project would include development of a decision support tool by means of a flow diagram detailing under which conditions strip tillage is most likely to be effective. The aim is to enable growers to make more informed decisions. The information gathered as part of the literature review would permit BBRO to identify any outstanding research and knowledge transfer requirements that would enable growers to utilise strip tillage techniques effectively in the UK.

We hope to outline the results of this desk study at our open days in May 2014.

**BBRO in-house projects**

The projects below will be delivered by our team. The first two are one-year projects to get proof of concept during the 2014 season; if proven, they will lead to full project proposals in the following years.

### New Work

<table>
<thead>
<tr>
<th>Project title</th>
<th>Start date</th>
<th>End date</th>
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<tr>
<td>Identify the limitations to water uptake by the sugar beet crop and how these can be mitigated</td>
<td>Jan 2014</td>
<td>Dec 2018</td>
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<tr>
<td>Identify rooting traits for optimal nutrient uptake by sugar beet</td>
<td>Jan 2014</td>
<td>Dec 2018</td>
</tr>
<tr>
<td>To improve understanding of the optimum seedbed for emergence and early canopy growth</td>
<td>Jan 2014</td>
<td>Dec 2018</td>
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These projects will be delivered in conjunction with our BBRO development team and science team.

We have also initiated a desk study to review strip tillage work. This will be carried out by Dr Nathan Morris of NIAB/TAG starting January 2014.

### BBRO internally led projects

<table>
<thead>
<tr>
<th>Project title</th>
<th>Start date</th>
<th>End date</th>
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<tr>
<td>To increase the profitability of the UK sugar beet industry through the reductions in soil tare</td>
<td>April 2014</td>
<td>March 2018</td>
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<tr>
<td>Optimisation of plant numbers and N supply to manipulate the partitioning of the crop dry matter and maximise sugar yield</td>
<td>April 2014</td>
<td>March 2017</td>
</tr>
<tr>
<td>Developing strategies to decrease violet root rot in sugar beet rotations</td>
<td>April 2014</td>
<td>Feasibility study 1st year</td>
</tr>
<tr>
<td>Do phosphites offer nutritional and crop protection benefits for the sugar beet crop</td>
<td>April 2014</td>
<td>Feasibility study 1st year</td>
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control fungal diseases such as downy mildew. Downy mildew is an increasing problem in the UK and no current control strategies, either varietal or chemical, are available. In addition, an artificial inoculation procedure will be developed to provide uniform infection pressure for glasshouse and field studies and to provide a potential method for assessing varietal resistance to this disease.

To increase the profitability and sustainability of the UK sugar beet industry through reductions in soil tare – Colin Walters (BBRO) – 4-year project

Large quantities of soil adhering to beet are delivered to factories during the campaign at considerable cost to the industry in transportation, removal and disposal. Improvements in the design and operation of harvesters and cleaner loaders that allow better removal of the soil on farm have mitigated this to some extent. Even so, soil tares in recent campaigns have amounted to around 350,000 tonnes (or the equivalent of 11,000 lorry loads) of soil delivered to British Sugar’s factories each year at a cost in excess of £2.5 million to the industry.

The project seeks to determine whether soil tares can be decreased further by changing on-farm storage practices to increase the rate of drying of the soil on lifted beet, thus making more of it removable prior to delivery. The questions it seeks to resolve are: would three to five days of storage under more rapid drying conditions – instead of immediate, ‘just-in-time’ delivery – allow more soil to be left on-farm rather than transported to the factory? What shape of store and length of time is needed to achieve this? Does store covering help the drying process? And will a reduction in the costs of soil transport and disposal outweigh the potential storage losses of sugar?

Optimising plant populations and N rates for modern, high-yielding sugar beet crops – Colin Walters (BBRO) – 3-year project

There is persuasive circumstantial evidence to suggest that some UK high-yielding sugar beet crops grown under modern conditions would benefit from higher-than-recommended plant populations and more N. An extensive three-year programme of experiments will examine this by testing factorial combinations of seven rates of N (0-200 kg/ha) and six plant population densities (50,000-150,000/ha) on different soil types. This will enable plant number/N rate yield-response surfaces to be created to more precisely establish optimal plant numbers and N rates for individual soils.

We will be outlining some of these projects at the winter conference in February. A full list of all BBRO projects can be found on the BBRO web site (www.bbro.co.uk).
Pests and diseases stateside: IIRB Group share experiences across the pond

By Dr. Mark Stevens, BBRO Lead Scientist and Chairman of the Pests and Diseases Group of the International Institute of Sugar Beet Research and Prof. Mohamed F. R. Khan, North Dakota State University and University of Minnesota

The Pests and Diseases Group of the IIRB meets at least once every two years to exchange latest research findings and to highlight any changes in the importance and dynamics of pests and pathogens across Europe and further afield. It also provides an opportunity for face-to-face contact with key sugar beet crop protection specialists within the member countries. As part of the ongoing meeting schedule, the group, along with the IIRB Weeds Group, was kindly invited to the Red River Valley, North Dakota, Minnesota, USA, by Professors Mohamed Khan and Gary Secor at North Dakota State University (NDSU). This provided an exciting opportunity to see some of the issues facing sugar beet production in the USA and to strengthen links with the American specialists too. The following is a brief report of the trip, held between 11th and 13th September 2013, highlighting some of the differences and similarities faced by sugar beet growers either side of the pond.

Twenty-six European specialists and 17 American researchers and agronomists gathered together in Fargo, North Dakota. The three day meeting began with a field trip to try and re-adjust the body clock and reduce the impact of jet-lag! Fortunately, we were greeted with almost perfect weather throughout our stay with temperatures in the high 20°Cs and with hardly a cloud in the sky. However, for the previous two months, the region had experienced drought conditions that had impacted on some of the pests and diseases in the area.

Aerial application of pesticides

Our first stop was to visit Mr. Gary Jerger, the owner/pilot of a 1981 Air Tractor (made in Olney, Texas) which he used commercially to apply a range of pesticides to crops (Pics. 1 and 2). To many of the Europeans present this was something we had not witnessed for many years but in the Red River Valley this method is widely used to apply glyphosate to herbicide-resistant beet or fungicides to control cercospora...
leaves spot later in the season. The group were given an excellent demonstration of Al’s flying abilities and pesticide application from the air. It was possible to apply 350 gallons per trip at a flying speed of 130 miles per hour. Droplet size could be determined by nozzle selection and height which was an important consideration depending on whether herbicides or fungicides were being applied; it was also a key consideration for drift too! In 2013, he had applied product to over 22,000 acres, but in previous years he had been commissioned to cover up to 60,000 acres. There was also increasing interest for ‘air seeding’ of barley as a crop cover for beet.

Soil-borne issues

Pathogens such as *Fusarium* and *Rhizoctonia* both cause very important diseases in the Red River Valley area and their presence significantly impacts on growers variety selection, growing practice and yield. These diseases are favoured by the continental climate of the Upper Mid-West where soils warm rapidly following drilling; other hosts within the rotation and soil conditions all play their part too. Currently, these diseases have a minor impact in the UK, primarily due to our maritime climate, but the increasing area of maize within some sugar beet rotations may have an influence on the importance of rhizoctonia in the future.

In order to select the best varieties and/or chemical control strategies the researchers at NDSU work closely with the agronomists from the sugar companies as well as the breeders to select the most appropriate varieties or fungicides. Fields with high fusarium pressure are selected for variety trials, and it was clear that some promising new varieties offering tolerance/partial resistance to this disease are available for the future (Pics. 3 and 4).
In addition, the US scientists were investigating the use of factory lime for the control of aphanomyces and have seen excellent results for this and other diseases including fusarium. Growers are now using factory lime for soil-borne disease management and further research is on-going at NDSU to investigate the potential mechanism(s) of disease control and the impact of calcium ions on the pathogen as well as on root growth benefits.

The group visited rhizoctonia trials (Pic. 5) at a separate location which had been artificially inoculated using barley grains cultured in the laboratory to propagate the disease and to ensure uniform disease pressure when applied across all varieties and treatments. Fungicides (e.g. triazoles, strobilurins and SDHIs) are widely used to control rhizoctonia and can be applied in-furrow at drilling and/or targeted to hypocotyl and root area of plants. In the USA, when temperatures reach 65°F (18.3°C), growers are advised to spray to control rhizoctonia.

**Herbicide-resistant tolerant sugar beet experiences**

Glyphosate-resistant sugar beet varieties are extensively grown in the Red River Valley. This has simplified weed control and, usually, two applications of glyphosate ensure that there is no competition from weeds. However, we visited one site where resistant weeds had been identified (Pic. 6) (e.g. water hemp – an *Amaranthus* species) and the NDSU scientists are re-visiting weed control strategies in light of these problems. In 2013, at this trial site, three applications of glyphosate achieved only 65-85% control and other examples were given where 50% weed control had occurred.

It was stressed that the timing of application was important and growers were now being encouraged to use pre-emergence herbicides where glyphosate-resistant weeds had been identified. Future crops of corn and soya, with alternative herbicide resistance, are being developed. These will enable alternation of products on such crops within the farm rotation and potentially restrict the build-up of more resistant weed species. Growers using this technology for sugar beet currently have to pay a technology fee of $85/acre (over £130/hectare) on top of chemical and application costs. Interestingly, there are now a small number of growers who are using conventional sugar beet herbicides in an attempt to manage their weed burden. These growers use conventional sugar beet (mainly in the Crookston Factory District) since they believe that the conventional varieties available have better resistance to Rhizomania. They have done a good job of weed control using conventional herbicides.

**Cercospora trials**

One of the other important threats in the Red River Valley area is cercospora leaf spot, again favoured by the prevailing climate. However, as it had been so dry in the region during the late summer very little disease had developed at the time of our visit. However, conditions became favourable for rapid disease development late in the season and resulted in a 27% reduction in recoverable sucrose if an effective fungicide programme was not used. Usually, varietal resistance is important along with the application of a fungicide programme with different modes of action. This helps to prevent resistance developing within the pathogen populations, which are monitored annually by the team at NDSU. They then advise agronomists and growers of the correct sequence of products to use each year based on these laboratory results and encourage fungicide application when 1-2% of the leaf surface is affected by the disease.

Again a series of trials is used to evaluate varietal resistance (Pic. 7) and fungicide performance following artificial inoculation with previously harvested and infected leaves applied by sprinkling into the canopy to encourage the development of the disease. Spore monitoring is now being investigated to fine-tune future advice to growers.
Other field trip highlights

As part of the visit, there were also opportunities to see a bioethanol plant in operation, and the latest sugar beet machinery at the annual Big Iron Show in Fargo, as well as the start of the sugar beet harvesting campaign. Unlike the UK, all sugar beet has to be harvested, ideally by the end of October or before the winter sets in, so beet is defoliated and lifted similar to the UK, but is then stored in piles at regional stations or at the factories where, as soon as winter arrives, it is frozen until processing, which may continue until the end of the following May. (Ref. 1)

Research paper highlights

At the start of the meeting, which was held in the USDA offices on campus at NDSU, Professor Mohammed Khan gave an overview of the latest American sugar beet production statistics, the main pests and diseases affecting the crop and current Research and Development priorities. This was followed by 20 research papers and, in keeping with what had been witnessed on the field tour, many of these focussed around soil-borne issues. These included latest data on seed treatments for rhizoctonia and the sensitivity of the pathogen to fungicides. A novel Fusarium species has been characterised in the USA, but fortunately this is not present in Europe (yet!).

Rhizomania still causes concern, but modern molecular techniques continue to improve our understanding of this disease although it remains a complex interaction between the virus, vector and its sugar beet host and there are clearly different strains that can challenge existing varieties.

There were also five papers relating to the evolution and control of cercospora leaf spot. This pathogen remains a global problem and resistant strains continue to arise, highlighting the need for integrated pathogen management with advanced warning systems using in-field weather and spore monitoring systems alongside resistant varieties and fungicides.

Other presenters discussed the selection pressure on beet cyst nematode populations when exposed to susceptible and resistant varieties, the rise of spider mite issues in Poland, and the latest situation with neonicotinoid usage in Europe.

In addition to the presentations the group was also given an opportunity to visit the microscope suite at USDA as well as the new research and development glasshouse and growth room facilities at NDSU. These are still being commissioned, but the university has just invested $35 million to erect 1.7 acres (0.7 ha) of glasshouse and additional support services. These highly impressive facilities are at the leading edge of technology that will provide the university with the necessary infrastructure for fundamental and applied plant research for many years to come.

References

Frost insurance policy 2013/14

The 2012/13 campaign saw the introduction of a new frost insurance scheme for the UK sugar beet crop by the National Farmers Union.

The principle behind the introduction of the insurance was to provide an economic safety net for growers where frost damage causes extensive losses of crop on farm. Meetings held following the severe winter in the 2010/11 campaign where many growers experienced significant crop losses due to frosted beet resulted in calls for the NFU to secure such a policy for protection against such losses from severe frosts in the future.

Following these grower meetings, with no existing policy available on the market extensive work was carried out by NFU Sugar in conjunction with two leading insurers, Endurance and the NFU Mutual, to develop from scratch a bespoke product to meet the needs of UK sugar beet growers.

After successfully securing and launching the new insurance product for the 2012/13 campaign, attention soon turned to refinements of the policy in future years.

Throughout 2013 NFU Sugar has been working to secure further improvements and changes to the original scheme.

Discussions took place with various insurers in addition to those involved for the original policy to further improve the cover offered for the 2013/14 campaign in the interests of growers.

What has changed in this year’s policy?

The ‘trigger mechanism’, and in particular the reference period in which an insured frost event must have occurred to activate the cover, was the main focus for development. With the concept of the insurance established in the 2012/13 campaign and interest generated in the insurance market for
The daily temperature does not need to be -4°C on each day in this period, the temperature assessment is taken by averaging the whole ten day period.

Once this ten day average temperature is recorded at any one of the named weather stations, the cover is fully activated across the entire UK crop contracted to British Sugar, in all beet growing areas for losses in the campaign.

The three Met Office weather stations where these temperature measurements are taken are located:
- Waddington, near Lincoln
- Wattisham, near Bury St. Edmunds
- Marham, near King’s Lynn.

The weather stations have been chosen to provide sufficient coverage of the different conditions across the beet growing areas by both geographical spread and local climatic conditions.

It was a requirement of the policy that independent, verifiable data was used for assessment of the temperature trigger which these provide. In order to assess the relevance of the weather stations for the policy an extensive assessment of the Met Office data from over 60 years from these stations and of the campaign data held was undertaken to ensure that these locations would have provided qualifying information for the trigger in years where there has been known adverse impacts from frosts.

How is a claim calculated?

Growers, as beneficiaries, do not need to take any steps to make a claim; once the temperature trigger has been reached the cover is activated automatically. As a grower the actual yield you have delivered will be confirmed using British Sugar beet intake data following the end of the campaign.

The NFU, as the policy holder, will inform all growers in writing when a frost event triggering the cover has been reached.

The trigger explained

For a frost event to trigger the policy, during the period from the 1st October 2013 to 31st January 2014 one or more of the named weather stations will have to record an average temperature of -4°C or lower from a period of ten consecutive days.

- The 10-day period must be a single period of 10 consecutive days and does not relate to a total number of days during reference period.

- There will not be a ‘mix’ of the minimum temperatures between any of the three weather stations.

The BBRO table below shows indicative frost damage for beet in field.
The cause of the losses, for example whether the beet was in a clamp or still in the field, or whether the losses were linked to the frost which triggered the cover is not relevant to a claim being paid. The loss will solely be determined by the verified overall delivered yield following the end of the campaign.

**Insurance Certificates**

Growers, as the beneficiaries of the frost insurance, will have received a copy of their Certificate of Insurance at the start of the trigger reference period in October. Growers are advised to read the information provided on the Certificate and check their details are correct. The full policy details and further information on the frost insurance policy can be found on www.nfusugar.com

Growers who did not complete crop area declarations by the notified deadline and following reminders are not enrolled in this frost insurance scheme for 2013/14 as their crop area was not able to be included within the policy in time.

**Losses attributed to crop emergence in 2013**

Any emergence losses identified by the BBRO (British Beet Research Organisation) in their on-going examination of the seed genetics, priming and pelleting during the 2013/14 campaign are excluded from this policy.

**Key features of the policy explained**

**Crop insured:** All CTE and ICE contracted tonneages are covered by the policy. Surplus is not included.

**Insured (approved) tonnage:** The validated crop tonneages for each contract which is subject to the insurance policy. This assessment is carried out with reference to the crop area declarations and a growers average 5 year yield as well as taking account of any additional relevant factors in the growing season.

**Value insured:** Total cover for each contract is for up to 50% of the value of insured (approved) tonneage which has not been delivered following a frost event.

**Excess/claim threshold:** For a claim to be made, growers will have to have delivered less than 85% of their insured tonneage. Growers therefore bear the equivalent loss of the first 15% of contracted tonneages.

**Total policy value:** The annual aggregate limit of indemnity of the overall scheme is £15m. This represents net losses of a year approximately half as bad again as 2010/11.

**Policy holder:** The NFU is the policy holder on behalf of all growers, who are the named beneficiaries of the policy.

**Insurance type:** The insurance is ‘trigger-based’, meaning that a trigger event must have occurred before the cover is activated and losses can be claimed.

**Losses:** The policy will cover losses as a result of a defined frost event only. Losses from other factors such as disease or pest damage to the crop are not included in the insurance.

**The reference period:** The period from 1st October until the 31st January (inclusive).
2013 emergence issue – a review by the BBRO

A major issue for a number of growers this season was the poor emergence of some seed, often associated with abnormal growth. This came to light in April and, to try and identify the cause or causes, the BBRO were asked to undertake a detailed and independent scientific investigation into the issues. As well as tests in its laboratories in Norwich, it also commissioned work from UK universities, government agencies and European institutes and laboratories. This article gives a brief overview of the findings to date as some tests will not be completed until after this issue of the British Sugar Beet Review goes to press.

The problem

The first problem sign that growers noticed was poor, erratic emergence in affected fields resulting in low establishment (30,000 to 65,000 plants per hectare). In some fields only one variety or seed bulk appeared to be affected. The seedlings lacked vigour and often the hypocotyls (seedling shoots) and radicals (seedling roots) were distorted or twisted. A number of the roots had black tips. Many of the root systems then appeared to be compromised with a proliferation of fibrous roots with no main tap root. Picture 1 shows symptoms from the first samples received in the BBRO Plant Clinic.

The majority of complaints were in the Bury St. Edmunds factory area with relatively few in the Newark area (see Pic. 3).

Picture 1 – First BBRO plant clinic sample 29th April 2013.

Picture 2 – A field showing different emergence, in this case the seed was the same variety but the three ‘good’ rows were Cruiser Force treated, whilst the remainder of the field was treated with Poncho Beta. However, in other examples the opposite effects were observed.
The tests

When the first samples were received, there were some comments that *Aphanomyces* (black leg), rhizomania or nematodes (free-living or beet cyst) might be causing the problems. Subsequent tests by the BBRO ruled these out as being a factor.

The studies on emergence were based and designed around samples and comments received by the BBRO from growers, agronomists and British Sugar area managers. The tests included standard and tank germination tests at different temperatures, soil cold tests, determination of pesticide loading and pellet interaction studies.

A large number of variables were involved (Fig. 3) and it was not possible for the BBRO to test all of these individually and in combination. Therefore it deliberately concentrated on the main seed lots where issues were identified via the British Sugar official complaints process.

All 2013 commercial seed supplied to growers, as agreed by the NFU and British Sugar, was processed as Xbeet® plus (the ‘plus’ indicates the new pellet used with the Xbeet® priming treatments to the seed). There were no equivalent batches of Xbeet® treated seed (i.e. with the previous pellet).

The 2013 season was colder (by 6°C) than the long-term average (see Fig. 2) and this was taken into account in the design of the tests undertaken. The BBRO is working with Weatherquest, a commercial weather forecast service, to analyse all complaints data against a range of weather and soil variables to understand the impact of the cold, dry seedbed conditions in 2013.
for direct comparison in our studies. Scientifically, this was disappointing, but BBRO were given access to everything that was commercially available and were able to use these in its tests. Previous seed stocks from 2012 are available but these cannot be compared directly to seed sown by growers in 2013, as they would have represented different bulks of seed from the breeders with the Xbeet® treatment and the previous pellet type. However, Germains did process several small non-commercial batches of raw seed, originally supplied by the breeding companies, with either Xbeet® or Xbeet® plus and the BBRO will complete the final tests using these by the middle of December.

The three representative sources of seed used for the main investigations were Cayman (bulks 252, 258 and 259), Pasteur (282) and SY Muse (211, 212, 223, 224, 225, 227 and 228) and their respective seed treatments of either Poncho Beta, Cruiser Force or Nuprid 60, as well as standard seed, and also the original raw seed lots supplied by the breeders to Germains. These seed lots came from Germains’ retained samples, commercial boxed samples from the Frontier seed store plus some samples from specific growers.

Germination tests using filter papers

At above 16°C, all seed, regardless of variety or treatment, germinated at or above accepted Industry standards in traditional germination tests Fig. 4. Very few abnormal seedlings were observed, again in line with Industry tolerance levels.

Tests conducted at lower temperatures showed the following:

- Decreasing the temperature of the test increased the germination time as expected, but all Xbeet® plus treated seed lots achieved over 94% germination within 27 days at a mean temperature of 8.5°C. At this temperature, differences in the rate and final germination of the raw seed of the three varieties and their bulks were observed (the germination of the different varieties ranged from 42 to 90% after 42 days). These differences were not observed once primed and pelleted by Germains.

- Decreasing the temperature increased the number of abnormal seed types, including the twisted hypocotyl and black root tip phenomenon. The percentage of abnormal seedlings varied between varieties, their bulks and final processed seed. In one particular grower sample, the number of abnormal seedlings counted was double (40%) that of an equivalent retained sample (21%) from Germains.

---

Fig. 3 – Some of the complex interactions.

Fig. 4 – BBRO laboratory germination tests - 16.9°C.
Although variations were seen in the speed of germination, there were no differences in the final percentage germination of the non-commercial batches of Cayman, Pasteur or SY Muse when treated with either Xbeet® or Xbeet® plus (range 95-100%).

Further cold tests remain ongoing with results expected in December.

**Germination tank tests**

In addition to the standard germination studies described above, further tests were commissioned at Nottingham University using a novel procedure that allows seeds to germinate on filter paper suspended in water tanks so that roots can grow unimpeded to a depth of 30 cm. These tests continue with final results expected in December, but to date these have shown:

- More abnormal seedlings (twisting/curling/black root tips) were observed than the standard tests described above, these were evident at 18°C.
- Differences between varieties and bulks identified in the above tests were reconfirmed by these studies.
- Tests at lower temperatures remain ongoing.

**European soil emergence test**

BBRO commissioned a European laboratory (IRBAB, the Belgian Sugar Beet Research Institute) to evaluate all the above seed lots using an industry accepted test that is performed on a compost/sand mix at a constant 10°C for 17 days. These tests showed that the final stand of all seed lots was good (over 99%) by the end of the test. However they did show the following:

- All raw seed batches had a delayed emergence compared to Xbeet® plus seed lots.
- Differences in the speed of emergence were observed between varieties and their treatments.

The commercial boxes of seed had a slower emergence rate compared to that of the retained samples from Germains with the sample from a grower batch slower than both of these.

**Pesticide loading**

The loading of the neonicotinoid seed treatments on seed was tested at two different laboratories, including FERA (the UK government’s Food and Environment Research Agency at York). Both confirmed that thiamethoxam (Cruiser), clothianidin (Poncho) and imidacloprid (Nuprid) were present on appropriate seed lots, and generally levels were within accepted limits, although one laboratory found that the latter two products were just below the minimum accepted standard from their tests. We do not believe this to be significant and possibly relates to calibration of the tests.

**Root shape/fanging issues**

Root shape and fanging issues were first noted mid-summer with some plants showing symptoms like those in Pic. 5. As the crop matured a number of fields had symptoms with pronounced trident-shaped roots (Pic. 6). In some cases the causes were poor soil structure but in others the soil structure appeared to have been good all through the season. Whilst it is reasonable to expect roots damaged at emergence, to be fangy, there was no clear-cut correlation between fields affected by emergence issues.

The UK RL variety trials do not use primed (Xbeet®) seed but in 2013 did use the new Xbeet® plus pellet. BBRO are currently assessing these trials as they are harvested, to determine the extent of any fanging across the varieties. The results of this section of work will be available by mid-December.
Global perspective

Most of north-west Europe experienced a cold, dry spring following a very wet autumn and winter period. Consequently, seed beds were often challenging to produce, although the very dry period during March and early April helped to produce a fine tilth for sowing spring crops. A number of final plant stands have been affected according to reports received. In addition, following recent IIRB meetings in France and North Dakota, USA (a similar spring was also experienced there) poor shaped roots are being reported in some of these countries that look similar to those found on some UK farms.

We are also aware of emergence issues with the variety Pasteur in countries such as France and Germany, and these have been attributed to interactions between the pellet type and weather, leading to a hardening of the coating and consequent problems with germination. A novel test has just been developed by scientists in Europe to identify the cause of this problem and the BBRO has contracted them to evaluate UK seed batches at a German laboratory.

Outstanding tests

There are four main tests that are ongoing with results expected by the end of December. These include the pellet type and weather interaction study in Germany, the assessment of fanging in the UK RL variety trials, cold and
There were no differences in the final percentage germination of the non-commercial 2013 batches of Cayman, Pasteur or SY Muse seed when primed and pelleted as either Xbeet® or Xbeet® plus (range 95-100%).

Interim conclusions and recommendations

- There were no differences in the final percentage germination of the non-commercial 2013 batches of Cayman, Pasteur or SY Muse seed when primed and pelleted as either Xbeet® or Xbeet® plus (range 95-100%).
- Standard germination tests conducted above 16°C showed acceptable levels of germination (95% plus) of all commercially processed seed.
- The BBRO has highlighted differences in the germination and number of abnormal seedlings within tank and cold (stress) tests between bulks of the same variety as well as between retained and grower samples of the same finished product. This is being investigated further.
- The BBRO believe that all seed should undergo standard as well as cold temperature tests to identify any potential issues under cold stress. However, if adopted, this would have implications for commercial seed processing and it’s on-farm delivery.
- The BBRO suggest that further samples are kept throughout the seed processing procedure so that lots can be re-evaluated if issues arise for example with germination as in 2013.
- The BBRO believe future studies are required to investigate the relationship between overall seed size, its embryo, priming and the impact on germination under stress conditions.
- No emergence issues were recorded in any of the BBRO/BSPB variety trials and these were treated with the Germains plus pellet only.
- There is no clear link with fanning and emergence issues but these studies are ongoing.
- BBRO will investigate the use of extended weather forecasts as a risk management tool at drilling.
- We encourage all growers to record the location of each variety within fields to assist with any future investigations regardless of issue.

Overall, the BBRO believe that the 2013 emergence issues have been caused by a number of interacting factors, but the prevailing weather during the sowing period has played a significant role in triggering these problems, as also seen in other emergence issues throughout northern Europe. Further germination tests are on-going to reconfirm these findings and the BBRO will be recommending that consideration is given to carrying out a series of pellet trials in 2014. The BBRO will continue to ensure that all new technologies are tested robustly and independently before being released to industry to give confidence to all as has been demonstrated by the yield increase of sugar beet in the UK over the last 25 years.

A full summary of these studies will be presented at the BBRO Winter Conference on the 4th February 2014 at the Peterborough Arena.

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**BRITISH sugar beet review**

WINTER 2013 • volume 81 no. 4
SUGAR BEET DRILLS
Is your sugar beet drill performing well or should you update?

Sugar beet drills have advanced considerably during the last ten years, particularly with the advent of electrical systems and the utilisation of GPS through satellites. Many nice-to-have functions that were only dreams a few years ago are now a reality. This article reviews what precision drills can do today, whether you should update your drill and, if so, what features you should look for when buying a new or second-hand precision sugar beet drill.

The main function of the sugar beet drill

Essentially, the main purpose of the sugar beet precision drill is to place seed accurately and consistently at the desired spacing and depth, into a suitable seedbed giving a good seed-to-soil contact. So, when the time is right and the weather and soil conditions are suitable, the aim is to get the sugar beet drilled as quickly as possible. Ideally, accurate drilling should result in a uniform crop with an even plant population of 85,000 to 100,000 plants per hectare. The success of the drilling operation will influence your sugar beet yield; get it right and you have the ideal foundation for a successful crop. To get it right, avoid badly worn drills and make sure the drill is set up correctly; R&D has shown that the effects of poor drilling will be seen throughout the growing season and all the way to harvest, when a non-uniform crop will be difficult to lift resulting in higher harvest losses.

Is it time to update?

Sugar beet drills, like any other piece of agricultural machinery, will eventually wear out and become out-classed as newer versions become available. Keeping your old drill going may seem like the less expensive option, particularly when growing smaller areas of sugar beet, but actually this strategy may be costing you more than is necessary when a new or
newer second-hand drill, offering many more options, would give a better return on investment.

Older precision drills are generally quite basic, lacking options such as soil engaging parts, front clod pushers, intermediate press wheels, or the wide choice of press wheels and seed spacing offered by modern machines. Usually they are also slower to operate, often requiring additional cultivations to produce a suitable seed bed in which they can operate, and spare parts are becoming limited, so eventually you may be forced to buy a newer drill or use a contractor.

It might be worth reviewing your current drill or drilling strategy and seriously consider whether you are getting the most out of sugar beet drilling at the present. More people are looking to exploit precision drills for oilseed rape, which is quite common on the continent, or crops such as maize for energy production. More cultivation options are being practised such as direct drilling, minimum tillage and strip tillage as well as traditional ploughing. A move to such a different system may affect the choice of features on the drill.

The latest developments

With the advent of modern electronics and GPS technology high levels of precision seed placement can be achieved. Newer drills can be set up more easily, have more seed spacing options, are easier to set for depth, and can be operated faster without any loss in accuracy. Some manufacturers offer an electric drive version, which is now more popular than mechanical versions. They have been manufactured with new technology in mind which means that some can now be set up to use GPS and, through the ISOBUS system, linked to the tractor. For example, seed rates can be tailored to the field or to changes in soil type; full tramlining with seed rate adjustments either side of a missing row can easily be accommodated. Geo control is another option available from some manufacturers, giving accurate shut off at the end of rows as you reach the headland, thereby reducing the need to tidy up row ends with a tractor hoe.

GPS can also be used to guide automatic steering on the tractor, enabling sugar beet to be drilled in dead straight rows, covering more area each day and making the whole operation less tedious for the driver; even night time drilling could be contemplated. Newer drills can also carry out some soil movement at the time of drilling, meaning that the number of cultivation passes could be reduced, or a less expensive seedbed harrow could be used.

Check list for updating your sugar beet drill

What area is there to drill?

Aim to have sufficient capacity to complete drilling within 10 to 14 days.

Are other crops to be drilled?

For drilling sugar beet only, a mechanical drill is the best and lowest cost option. If other seeds are to be catered for, a pneumatic drill may be the overall best option as there is a wider choice of seeding discs which are cheaper than changing cell wheels on a mechanical drill. Performance tests have shown that pneumatic drills are not as accurate as mechanical drills.

Size of drill

Most drills are sold in 6, 12, 18 and 24 row systems with 12 and 18 row the most popular. The number of rows to buy depends on the area there is to drill.

Row width

Growing sugar beet on 50 cm or 45 cm row widths need make little difference in terms of the resulting plant populations. Using 50 cm, the most popular for sugar beet in the UK and a seed spacing of 17.5 cm or using 45 cm and a seed spacing of 20 cm will result in adequate numbers of seeds being sown.

Folding mechanisms

Most manufacturers offer options for ease of transport between fields. For drills bigger than 6-row, this must be considered.

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Are tramlines to be used?
Most new or newer drills can be specified with a tramlining kit. For electric-driven drills it is fairly easy to set-up and use.

Seed adjustment options
If the aim is to adjust seed spacing while drilling a field, or to close the spacing while tramlining, then an electronic drill will be needed.

Is direct or mulch drilling required?
If direct drilling or mulch drilling is to be used where wind or water erosion can be a problem, then disc coulters will be needed as an option.

Can granule synchronisation be specified?
Although the use of granule applicators is not so common, with the current stewardship schemes surrounding the use of granular nematicides, opting for a drill which can synchronise granule and seed drop will help to reduce the amount of granule product needed if docking disorder is a known problem. Some manufacturers still offer granule applicators as an option, but not all will offer the granule synchronisation system.

Are different press wheel options required?
Where soils may be prone to capping or wind erosion, star shaped press wheels would be useful as they tend to press the soil around the seed, but leave the soil rougher on the surface.

What other soil covering arrangements are there?
Many new drills come with other soil covering options. Depending on your soil type, some of these do offer benefits, such as using intermediate press wheels, especially if it is dry as they help to consolidate the soil around the seed, aiding seed-to-soil contact.

What is the after sales support like?
Having a good dealer locally will mean that there should be a good supply of spare parts, access to advice and after sales services such as drill testing.

1. Stanhay,
   BCS House, Pinfold Road, Bourne, PE10 9HT
   Tel 08451 801480
   www.stanhay.com
   Currently selling the Webb 7 mechanical drill

2. Kverneland UK,
   Walkers Lane, Lea Green,
   St. Helens, Merseyside, WA9 4AF
   Tel 01744 853200
   www.kvernelandgroup.com
   Currently selling the Monopill mechanical and electric drive drill and the Optima, pneumatic air drill.

3. Vicon,
   Walkers Lane, Lea Green, St. Helens,
   Merseyside, WA9 4AF
   Tel 01744 853200
   www.kvernelandgroup.com
   Currently selling the Unicorn mechanical and Synchro drive and a mechanical and Synchro drive direct drill.

4. Toucan Farm Machinery Ltd,
   The Grove, Massingham Road, Castle Acre,
   King’s Lynn, Norfolk, PE32 2BG
   Tel 01760 755009
   www.toucanfarmmachinery.co.uk or www.monosem.com
   Currently selling the Meca V4 mechanical drill and the NC and NG Plus pneumatic drills.
5. Kongskilde UK Ltd, Hempstead Road, Holt, Norfolk, NR25 6EE
   Tel 01263 713291 www.kongskilde.com
   Currently selling the updated Becker Centra and Becker pneumatic drills.

6. Standen Reflex Ltd, Hereward Works, Station Road, Ely, Cambridgeshire, CB7 4BP
   Tel 01353 661111 www.standenreflex.com
   Currently selling the unique Herriau Turbosem, pneumatic drill.

7. Amazone Ltd,
   Sales and Administration, Blyth Road, Harworth, Doncaster, South Yorkshire, DN11 8NE
   Tel 01302 751200 www.amazone.co.uk
   Currently selling the Amazone range of pneumatic drills.

Taking time now to review your drilling strategy will be time well spent as operating an out classed drill may be costing you money. Time spent getting the drilling operation right will enable you to get the best start for your next year’s sugar beet crop.

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Weed beet – by the scruff of its neck!

Weed beet and bolters continue to be a major threat to beet yields and the UK sugar beet industry. There do not appear to be any ‘quick fixes’ available in the short to medium term but we do continually see how this threat can be effectively managed where growers apply good and timely husbandry. In many instances, problems can be traced back to a legacy of neglect or just one bolter-pulling ‘holiday’ at some time. This article considers the control methods available, their relative cost-effectiveness, and incorporates an on-farm working example from the 2013 growing season.

Bolting – where it all starts
Sugar beet is a biennial plant, with vegetative production in year one, producing an energy reserve in preparation for year two, the reproductive phase, when a flowering stem is produced. During the winter, the beet is vernalised by cold temperatures which trigger the biological processes to initiate the reproductive phase. The sown crop can be vernalised if sufficient cool weather occurs in the spring, triggering a percentage of beet plants to enter the reproductive phase in year one rather than producing a good harvestable root. Weed beet are the annual form of sugar beet; that is they produce seed in their first year of growth and their seed production is much more prolific than maincrop bolters (typically 1,500 per plant). Most weed beet derive from bolters in previous crops, the annual habit being dominant, and hence biennial bolters tend towards annuals given time.

Yield loss and additional problems
Weed beet and bolters are a major problem because they reduce yield by around 11% per tall weed/m² by shading the crop (Pic. 1) and, in addition, the offending plants will not produce any appreciable yield themselves in terms of root weight or sugar content (Ref. 1). Other problems include reduced harvester efficiency, increased dirt tare, competition in other crops in the rotation, increased risk of violet root rot, beet cyst nematode and rhizomania, as well as being detrimental to farm hygiene as a potential ‘green-bridge’ for other pests and diseases such as aphids and downy mildew.

There is a range of control methods for weed beet, each having its own role in a control strategy (Table 1).

Rogueing
The only way of being absolutely sure of eliminating seed return from weed beet and bolters is by physically pulling them out of the ground by hand before viable seed
### Table 1 – Weed beet control measures.

<table>
<thead>
<tr>
<th>Control method</th>
<th>Typical weed beet/bolter population</th>
<th>Cost (£/ha)</th>
<th>Positives</th>
<th>Drawbacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tractor hoeing</td>
<td>All situations where weed beet present in row crop</td>
<td>20 - 30</td>
<td>– Removes 60 - 70% of weed beet - consequential soil aeration may be beneficial on some soils</td>
<td>– Can stimulate further broad-leaved weed germination – Wheelings in crop – Good operator required to avoid crop loss – Timing, machine setup, hoe blade selection and condition important</td>
</tr>
<tr>
<td>Hand pulling</td>
<td>&lt;1,000/ha or more? See text below.</td>
<td>20 - 30</td>
<td>– Absolute control if done with care – Two passes may be needed to ensure success</td>
<td>– Relatively slow – Higher cost for denser populations – Hard work – Stems can snap off when extracting roots – Timing important to avoid having to remove plants from field</td>
</tr>
<tr>
<td>Weed wiping</td>
<td>1,000 - 10,000/ha</td>
<td>32 (two passes)</td>
<td>– Can control larger populations – Done correctly can provide a good level of control</td>
<td>– Timing is important – Relatively slow, at least two passes required – Care needed or damage to crop from dripping glyphosate can lead to significant yield loss – Slow kill of weed beet means they can still reduce yield by shading crop</td>
</tr>
<tr>
<td>Cutting</td>
<td>10,000+/ha</td>
<td>32 (two passes)</td>
<td>– Can prevent seed maturation – Reduces viable seed return</td>
<td>– Many seeds left within crop canopy – At least two (ideally three) passes required – Not suited to un-level fields – Short-term cosmetic effect as regrowth will shade crop</td>
</tr>
<tr>
<td>Inter-row spraying</td>
<td>All beet crops</td>
<td>20 - 30</td>
<td>– Controls around 60% of weed beet – Doesn’t stimulate germination of fresh weed seed – Can incorporate an ‘over-the-row’ selective herbicide application</td>
<td>– Contractor service not widely available yet, ideally used in conjunction with RTK GPS, effectively a chemical inter-row hoe</td>
</tr>
</tbody>
</table>

#### Cultural control methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Cost (£/ha)</th>
<th>Positives</th>
<th>Drawbacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stale seed bed plus total herbicide</td>
<td>10,000+/ha</td>
<td>– Can control a large amount of the expected weed beet population (typically 60%) – Provides a ‘clean slate’ by reducing all weeds in field</td>
<td>– Drilling delayed significantly to the detriment of crop yield – Late emerging weed beet not controlled – Delaying drilling could result in a dry seed bed for the subsequent crop</td>
</tr>
<tr>
<td>Extending rotation</td>
<td>10,000+/ha</td>
<td>– Increases number of non-beet crops in which weed beet can be controlled chemically and/or culturally</td>
<td>– Potentially detrimental, affecting other crops in the rotation – Could have negative effect on farm business margin</td>
</tr>
<tr>
<td>Minimum tillage</td>
<td>10,000+/ha</td>
<td>– Non-inversion cultivation can help exhaust weed beet seed at the depth they can break dormancy as only 1% of weed beet seed will emerge from below 10 cm (Ref. 2)</td>
<td>– Careful soil management required to achieve good sugar beet seed beds – Non-inversion tillage may make remedial soil structural work more difficult – May make control of other problem weeds in the rotation more difficult e.g. blackgrass and wild oats</td>
</tr>
<tr>
<td>Control in other crops</td>
<td>Any</td>
<td>– Other crops in the rotation can provide an excellent opportunity to control weed beet culturally and chemically – Very good opportunities to achieve this are available in nearly all other crops</td>
<td>– May require minor adjustments to herbicides used in other crops – May increase cost a little or affect efficacy of primary target control – Not available in all crops – red beet being major exception</td>
</tr>
<tr>
<td>Recording</td>
<td>All</td>
<td>– Recording areas and densities of weed beet in fields, frequency of cropping and inversion tillage, will provide the information required to devise a plan of appropriate control measures</td>
<td>– None</td>
</tr>
</tbody>
</table>
matures. At this stage, breaking the stem and leaving in the field to wilt is all that is required. If this had been done with all bolters, in all sugar beet crops, since the dawn of our industry, national yield would be significantly greater and many fields would look a great deal more attractive.

Unfortunately, rogueing is often ruled out as the offending fields can appear daunting from the road side. The alternatives are weed wiping or cutting, which give lower levels of control, that will be detrimental to the current and subsequent sugar beet crops. However, do we actually know what the cost/benefit of rogueing looks like?

Table 2 and Pic. 2 illustrate a working example from a field with a serious weed beet population controlled by tractor hoeing and rogueing in the 2013 sugar beet crop. Weed beet were counted in eight different areas of a field on the Wales Family Partnership farm at Marham, near King’s Lynn.

Table 2 – Field assessment of weed beet and bolters (WB) in July 2013.

<table>
<thead>
<tr>
<th>WB counts (at eight positions across field)</th>
<th>WB/m²</th>
<th>WB/ha if not tractor hoed (typically removes 2/3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>110,000</td>
</tr>
<tr>
<td>2</td>
<td>23</td>
<td>230,000</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>300,000</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>200,000</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>150,000</td>
</tr>
<tr>
<td>6</td>
<td>11</td>
<td>110,000</td>
</tr>
<tr>
<td>7</td>
<td>11</td>
<td>110,000</td>
</tr>
<tr>
<td>8</td>
<td>19</td>
<td>190,000</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>17.5</strong></td>
<td><strong>175,000</strong></td>
</tr>
</tbody>
</table>

*based on 2013 beet price of £28.01.

Table 3 – Economics of rogueing very high weed beet populations.

<table>
<thead>
<tr>
<th>Field area</th>
<th>11.60 ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total weed beet in field (average 175,000/ha)</td>
<td>2,030,000</td>
</tr>
<tr>
<td>Labour hours (field)</td>
<td>720 hrs</td>
</tr>
<tr>
<td>Labour cost</td>
<td>£8.50/hr</td>
</tr>
<tr>
<td>Field cost</td>
<td>£6,120</td>
</tr>
<tr>
<td>Labour cost</td>
<td>£527.59/ha</td>
</tr>
<tr>
<td>Break even yield increase*</td>
<td>18.84 t/ha</td>
</tr>
</tbody>
</table>

*based on 2013 beet price of £28.01.

Table 4 – Economics of rogueing a whole farm with a typical weed beet population, including the field detailed above with a very high weed beet population.

<table>
<thead>
<tr>
<th>Farm sugar beet area</th>
<th>83.64 ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time rogueing</td>
<td>1,039 hrs</td>
</tr>
<tr>
<td>Labour cost</td>
<td>£8.50/hr</td>
</tr>
<tr>
<td>Total farm cost</td>
<td>£8,831.50</td>
</tr>
<tr>
<td>Average labour cost</td>
<td>£105.59/ha</td>
</tr>
<tr>
<td>Break even yield increase*</td>
<td>3.77 t/ha</td>
</tr>
</tbody>
</table>

*based on 2013 beet price of £28.01.

Sounds expensive?

Tables 3 and 4 illustrate the cost of rogueing an individual field with a very high level of weed beet, and a whole farm with a fairly typical weed beet population respectively using this farm as an example.

Considerations

It is difficult to substantiate the exact yield increase achieved by rogueing the 11.6 ha field with the large population of weed beet in mid-July, as it will depend on the subsequent growing conditions. However, considering the crop competition before rogueing, an 18.84 t/ha yield increase is quite conceivable. Moreover, this field only accounts for around 14% of the total farm sugar beet area, the remainder of which had relatively low, or typical, levels of bolters and weed beet. The average rogueing cost per hectare across the whole farm is reduced to £105.59/ha, so it is therefore quite likely that the overall cost of rogueing will be recovered in this season alone, requiring only a 3.77 t/ha yield increase to break even. Indeed this is irrespective of the very significant, but less tangible benefits to the farm business from controlling weed beet.

Left uncontrolled, the seed return in the field featured in this article was going to
be massive, potentially rendering this field unviable for the sugar beet rotation for a number of years. Rogueing has mitigated this scenario more effectively than could have been achieved by weed wiping or cutting. Losing fields for sugar beet production can limit crop rotation options and could, therefore, be detrimental to other crops, such as spring cropping to aid control of blackgrass and the consequential effects on winter wheat yield. For the same reason known ‘weed beet fields’ could derive a lower land sale or rental value as the prospective incumbent’s options and growing costs may be affected.

While the overall weed beet seed burden in this field will have been significantly reduced because further seed return was prevented, the soil seed burden will not have been completely exhausted. This is because seed will be distributed to plough depth, beyond where germination will be triggered this season. In addition, there will be variation in seed dormancy. Next time this field hosts sugar beet rogueing will certainly be required again, hopefully at a much lower cost.

The field featured had a relatively consistent weed beet population across the whole field, as shown in Table 2. It is common to see a more uneven distribution in many fields, with isolated patches of weed beet. In these circumstances rogueing is even more cost-effective as ultimately there are fewer plants to remove, therefore cost estimates would have to be based on differing populations across specific field areas. It is also not uncommon for fields to be rogued twice to ensure control of any later emerging plants which were not easily visible the first time through; in the farm example used in this article, only 20% of the area needed to be walked twice.

Unfortunately it is often the larger farm sugar beet enterprises which avoid investing in rogueing, as the task appears daunting at first glance; yet, by employing gang labour, the cost per hectare is the same regardless of total crop area.

SUMMARY

- Control of weed beet and bolters is critical to increase productivity.
- Where weed beet are present, tractor hoeing is an essential management tool.
- Calculate remaining weed beet population to make an informed decision.
- Consider investing in rogueing even if weed beet population is high.
- Rogueing cost/ha should be apportioned to the whole crop, not just the area worked.
- Consider other factors when justifying investment in control, such as longevity of rotation.
- The earlier in the season that weed beet are controlled, the greater will be the yield benefit and the chance of recovering the rogueing cost in that year.

Acknowledgements

The author would like to thank Wales Family Partnership, Marham, King’s Lynn, Norfolk, for their contribution towards the data in this article and, indeed, their continued effort in driving increased yields by applying best practice to sugar beet production.

References and further reading

Neonicotinoid insecticides – a review of their contribution to the sugar beet crop

Introduction
Neonicotinoids are now the largest class of insecticides used around the world to control insect pests in a wide variety of crops, and also in animal health (e.g. to control fleas in cats and dogs). In the UK there are five neonicotinoid products approved and available for use, including acetamiprid, clothianidin, imidacloprid, thiamethoxam and thiacloprid; of those, three (imidacloprid, clothianidin and thiamethoxam) are approved for use in sugar beet as seed treatments, the latter two in combination with pyrethroids to broaden the spectrum of activity against soil pests (Ref. 1). Thiacloprid did have temporary off-label approval twice in the last five years, requested by BBRO, because there was some concern about poor uptake of the others in very dry conditions.

Neonicotinoids have been the subject of close scrutiny, particularly in recent years, owing to their perceived adverse impacts on the environment, especially on bees (Ref. 2), which has raised concerns about their long-term future. This article discusses issues related to the use of neonicotinoid seed treatments in sugar beet.

EU restrictions to neonicotinoid use
In May 2013 the European Commission imposed a two-year restriction on the use of three neonicotinoid products for seed treatment, soil application (granules) and foliar treatment on flowering bee-attractive plants and cereals as a precautionary measure. This was in response to concerns about declining bee populations throughout Europe. However, the reasons for bee population declines are not well understood. Despite this, claims made by lobbyists pushing for the ban on these plant protection products are that pesticides, including neonicotinoids, may be a contributory factor and this swayed opinion. The drastic restrictions are seen by many as being unjustified and disproportionate and going against the EU’s prime goal of encouraging food security. However, in spite of widespread opposition, restrictions will take effect from 1st December 2013 on the use of three neonicotinoids (clothianidin, imidacloprid and thiamethoxam). Although sugar beet is not included in this restriction, pressure continues to mount to extend the restriction to all crops.

Benefits of neonicotinoids
One of the main benefits of using neonicotinoid seed treatments is their very good systemic uptake into the leaves of young seedlings, providing excellent protection against many types of foliar pests, particularly aphid vectors of viruses. As a result, the use of granular aphicides, such as aldicarb (Temik) that were the former mainstay of aphid control, declined markedly, even before they were banned in 2003 (Fig. 1). Since the first introduction of imidacloprid (as Gaucho, from Bayer CropScience) in 1994, there has been a rapid uptake of the technology. Imidacloprid was replaced by clothianidin (in mixture with beta-cyfluthrin as Poncho Beta) from 2005 by Bayer, but remains as a product choice as Nuprid (from Nufarm since 2009). Thiamethoxam plus tefluthrin (Cruiser Force) was introduced in 2007 and is now the market leader (Ref. 3). Removal of these products as a result of a blanket ban across Europe would cause serious problems in controlling aphids and virus yellows following mild winters. This is because the principal vector, the peach-potato aphid (Myzus persicae), currently has high frequencies of resistance in the UK to the alternative insecticides that would need to be employed to control the disease, namely pirimicarb (Aphox and others) and pyrethroids such as cypermethrin or lambda-cyhalothrin. (Ref. 3).
The control given by these seed treatments lasts for up to 10 weeks after sowing, and thus replacing the early sprays that used to be applied following the use of granules. Now few sprays are employed on sugar beet (Ref. 4). Those that are used are targeted at other pests that arrive after mid-June, when the seed treatments have worn off, such as black aphids, *Aphis fabae*, or silver Y moths, *Autographa gamma*.

The consequences of good, prolonged control of virus-carrying aphids is the almost complete control of virus yellows in recent seasons, with only a few hot spots being recorded each year, usually where seed treatments have not been employed. Good virus control leads to yield responses of up to 25% with early infection, more than repaying the cost of the treatments (Figs. 2 and 3).

![Fig. 2 - Effects of neonicotinoid seed treatments on the incidence of virus yellows in sugar beet with early (16th May) and late (16th June) inoculation in 2006 (WAS = weeks after sowing) (Ref. 5).](image)

**Options**

One option for allowing more rational use of insecticides applied to seed pellets would be if the application could be delayed until the risk of aphid and virus yellows had been assessed using the best forecasts available. However, the earliest this can be done with any accuracy is at the end of February (Ref. 7). This would result in late applications to seed at a time when other work impinges on seed treatment facilities, but if the technology was made available for such late treatments, e.g. at the beginning of March, then, in years following hard winters, seed treatment costs could be reduced substantially (£40-45/ha) and the use of insecticides on the pellet avoided. In years following mild winters, there would be a need to streamline extra applications with consequent increased costs to pay for the extra treatment equipment required to cope with demand in the short term. In any case, the sugar beet industry will have demonstrated to the wider public that serious concern had been given to unnecessary overuse of chemicals, and there would be less environmental pollution, be it small, due to targeted seed treatment and not foliar sprays. However, the use of seed insecticides has been of benefit more often than not in recent years.

**The future?**

Neonicotinoids are now the top-selling insecticides worldwide. This is because they are highly effective against a range of pests both as seed and foliar applications and they have proved to be very resilient to the development of strong, control-busting resistance. Until recently, only whiteflies, *Bemisia tabaci*,
Colorado potato beetles (Leptinotarsa decemlineata) and brown planthoppers (Nilaparvata lugens) had managed this neat evolutionary trick. However, in 2009 there were reports by peach growers in southern France of control failures with neonicotinoid sprays against M. persicae, which is known to be very adept at evolving resistance to a wide range of other compounds. When samples were tested (by Syngenta and Rothamsted Research) they were confirmed to contain aphids carrying strong neonicotinoid resistance (denoted Nic-R++) based on a simple target-site mutation in their DNA. This was the first case of strong neonicotinoid resistance seen in any aphid species (Fig. 4). Subsequent monitoring has shown that highly resistant aphids are now also present in north-eastern Spain and northern Italy and they have recently been found on other hosts such as eggplant and peppers. Furthermore, tests have shown that Nic-R++ aphids can feed and reproduce on many different hosts, including sugar beet, so they are not restricted to a few crops. The appearance of these forms at an initial hotspot and their establishment and spread mirrors the evolution of MAEC resistance (to pirimicarb) in M. persicae in the 1990s (which ultimately caused control failures in the UK within a few years), and highlights a substantial new threat to controlling this pest in this country.

In anticipation of the evolution and spread of neonicotinoid-resistant M. persicae, detailed monitoring of UK samples commenced at Rothamsted in 2004 and has continued through a number of projects relying on collaborative funding from Defra-CRD, agrochemical companies and levy boards, including BBRO. The good news is that, despite increasing neonicotinoid usage in this country, there has been no upward trend in the frequency of M. persicae showing reduced sensitivity to neonicotinoids (Nic-R and Nic-R’ forms) or any obvious association with crop, treatment history or the locality of sample collection, i.e. no Nic-R’’ aphids have been found to date in the UK. There is therefore no evidence of selection of any economically-significant neonicotinoid resistance by the current agronomic practices being used in this country. However, continued vigilance for the potential appearance of Nic-R’’ aphids, most probably coming in through immigration from abroad (either on imported plant material to protected environments such as glasshouses or as long-distance migratory aphids), remains a priority as research has shown that Nic-R’ aphid cannot be controlled by the neonicotinoid seed or foliar treatments that are currently being used to protect UK sugar beet, potatoes, brassicas (including oilseed rape), salads and ornamentals. Furthermore, continued monitoring is especially important for beet growers who do not currently have any registered viable control alternatives to the neonicotinoids that can also control MAEC and pyrethroid-resistant aphids prevalent in the UK. This is exacerbated by the lengthy registration process for approving new chemicals, which will take at least two years were there any immediate candidates for submission from the agrochemical industry. Indeed, it would appear that there is no such immediate possibility and future opportunities remain highly uncertain. This means that an extension of the neonicotinoid restriction to sugar beet would expose the entire UK sugar beet crop to virus yellows infection, resurrecting the spectre of damage caused in epidemic years such as 1974-1976. The yield reductions associated with these epidemics partially contributed to a large reduction in negotiated EU sugar quota. A repeat of this scenario would seriously compromise the viability of growing sugar beet in the UK, especially if global warming forecasts live up to expectation. It would at least condemn the beet industry to substantially reduced yields and increased costs at exactly the time when it is striving to raise competitiveness, increase the industry’s output, and contribute to food security goals.

In conclusion, our article highlights that nothing stands still in the world of crop protection. What was perceived to be the almost perfect control system for virus yellows in sugar beet is now under threat from a new combination of factors caused by pest evolution, climate change and revised legislation. Vigilance through continued resistance monitoring in M. persicae is crucial otherwise we will lose sight of the contemporary situation in the UK and abroad.

References
**BBRO Plant Clinic: 2013**

**Introduction**

The plant clinic is a service which has been offered by the BBRO to its levy payers for many years. The BBRO is now based in the Innovation Centre on the Norwich Research Park (Pic. 1) and, following re-organisation within the BBRO, the Plant Clinic has now moved to our new laboratory and offices in Norwich (Pic. 2). The plant clinic is being run on a daily basis by myself, Gillian Champion.

**New look**

The plant clinic has been re-branded, as seen at the spring BBRO open days (Pic. 3). All growers are welcome to come along to these events with their plant samples. If we are unable to help on the day we will report back as soon as is practical afterwards. This year we attended all four factory days and spoke to many growers.

**Pic. 1 – Innovation Centre, Norwich Research Park.**

**Pic. 2 – New laboratory.**

A new form has also been developed which must accompany each sample. Without its full completion, it can be very difficult to be able to determine the issue. The new form is intended to be quicker to use with the option for drop-down boxes to answer some of the questions. It has to be noted that paperwork with field histories, and other information which can be useful in diagnosing problems, has been sadly lacking on many occasions this year.

**Pic. 3 – The Plant Clinic on the road.**

**Spring 2013**

It is certain that every year is different and 2013 will be remembered for the issues surrounding emergence. The first of these samples was received by the Plant Clinic at the end of April and was initially brought in by a British Sugar area manager, who reported seeing twisted seedlings (Pic. 4) in the field and lower and slower emergence than expected.

Due to the complexities surrounding the emergence issues this year, it was not always possible to address specific questions from growers at that point. However, the information and samples received were extremely valuable when designing experiments to attempt to understand what had happened in certain fields in 2013. The emergence issue became the focus of an important extra area of work which was examined in great detail and is reported in more depth in this edition of the British Sugar Beet Review (Page 13).
Other problems at the Plant Clinic this year

In contrast to other years, we have also received quite a large number of photographs and these have been dealt with separately on an individual basis and have not been included in the summary below. If we look only at the physical samples received at the plant clinic, there are a number of issues which were more common than others. This chart (Fig. 1) illustrates the main issues with the samples physically received up until October 2013.

Of the physical samples received at the plant clinic, emergence issues represented the bulk of samples (22 received). Other reports of emergence issues were received by email and texts.

The next most common problem was nematodes, the majority of queries being in relation to beet cyst nematodes (BCN) (Pic. 5). A number of samples came to the clinic with suspected nematode damage and, in the majority of cases this was proved to be correct, although notably we also had some which did not have BCN. At our stand at Cereals 2013 we also exhibited oilseed rape plants which had grown on infected soil and which, as an alternative host, showed BCN cysts. We received a number of samples for testing for free-living nematodes, but most of these proved to be negative.

Soil problems

With such a wet previous autumn and winter last year giving poor conditions
for drilling, it is not surprising that we received a number of samples which had problems related to soil conditions. Waterlogging was a problem in some fields, as was compaction, and a failure to fully incorporate and disperse straw residues. Testing for low pH was also required for a number of fields and this could be a problem even on fields which had been limed.

**Herbicide problems**

A number of samples were sent with suspected herbicide damage and, although some were caused by beet herbicides, (Pic. 6) others were related to drift or residues. Molecules which are particularly active, such as the sulfonylureas or ALS herbicides, are especially likely to be a threat as only tiny traces can result in damage. These symptoms were sometimes exacerbated in the early season by interaction with low temperatures over winter and prior to drilling beet. Visual observation, without chemical analysis, can only go so far in identifying the cause and it is often only possible to relate symptoms to a class of chemical rather than to identifying the actual product. Of course the Plant Clinic has no way to know how this chemical came to contaminate these plants. Damage caused by non-beet herbicides should be notified to the appropriate bodies.

**Downy mildew**

Although we didn’t have many samples of plants with downy mildew early on, we did have a number of reports of plants in the field and it appeared as if this problem is increasing. Some late season samples appeared to have suffered from crown damage early on which had led to secondary infection with root rots. The absence of physical samples at the plant clinic is not unexpected since the symptoms are quite distinct and also there is no fungicidal treatment at present (Pic. 7). However, the issue still can be confused with virus yellows due to the build-up of starch giving the older leaves a yellow, leathery appearance.

**One-off problems**

As an avid reader of literature produced by the Plant Clinic in the past, it was interesting when a photograph was received of an issue which occurs rarely, such as this example of suspected lightning strike. This patch developed in a field and contains rotten beet, which appear to have been cooked in the soil (Pic. 8). I offer my thanks to Ben Goffin for this picture and presenting us with an interesting problem.

The role of the Plant Clinic continues to develop and if you have any views on the service it should offer please send them to the author at the BBRO (gillian.champion@bbro.co.uk).
ROPA have unveiled their first 2 axle beet harvester in 18 years: the euro-Panther, designed for optimum yields and higher daily performance in beet harvesting. Well-proven features of the euro-Tiger V8-4 and the euro-Maus 4 are incorporated in the new model together with the company’s latest technical innovations, making euro-Panther the strongest twin axled beet harvester in the market.

Now there are 2 big cats in the beet field!

See euro Panther in action on www.ctmharpley.co.uk or call to arrange a demonstration.

2 axle euro-Panther or 3 axle euro-Tiger: choose the best in class to suit your needs.
In recent years many farms have diversified, making use of their resources and skills to grow their business in a different direction, sometimes based on an interest or hobby, or simply because they need to bring in extra revenue.

Generally, diversification is based on common themes such as B&Bs, horse liveries, farm shops and golf courses but this article profiles a sugar beet grower who, for the last twenty years, has been doing something quite unique, contracting to the film and TV industries. Not many growers may be farming one day and the next day be on a film set miles away.

Andrew Hinch comes from a well-known Rutland farming family whose mainstay has been growing crops and rearing animals though they have always been on the lookout for new opportunities and, at one time, were also hauliers. Today, one of Andrew’s brothers runs a golf course near Oakham, while his other brother has a large, thriving poultry enterprise and a farm at Greetham.

In the 1980s, Andrew Hinch took over his grandfather’s mixed farm on the Rutland-Lincolnshire border, very close to Stamford. Today the farm is mainly arable with some grassland devoted to horse liveries and a few sheep. Key crops are cereals, mainly winter and spring barley, which grow well on the limestone brash soils, and sugar beet, with some land rented out to a potato merchant.

Sugar beet has been a main crop for many years and thrives well on the medium limestone soils. The current sugar beet contract of 1308 t is grown on 36 ha close to the main farm. For many years the farm has run a contracting service, with sugar beet operations being a key part. Consequently the family carry out all their own operations in the crop: drilling, spraying, tractor hoeing and harvesting. Contract harvesting is still offered as a service, but because they have only a three-row harvester, many clients have switched to contractors offering six-row machines. The sugar beet is normally
Long before filming begins, the location managers discuss what is needed with the production manager and director of the production. Although many sets are built and put together in a studio, there may be an equal need to find a suitable outside location, which could be anywhere.

Once the locations have been agreed and the necessary permissions obtained, attention is focused on what is required on the set to produce the desired effect. The location managers will approach suitable contractors, like Hinch Plant, and talk through their ideas, make site visits and then ask for quotes and associated risk assessments. Once these have been accepted, Andrew Hinch will then agree dates, order any materials required, and find and purchase any extra equipment that is needed. Generally, for one-off films or seasonal TV productions, all the planning and tendering takes place during the winter months. Filming inside a studio could take place anytime, but generally, and certainly for outside sets, filming usually takes place from the spring onwards, with the summer and autumn seasons being very busy times when the days are long and the weather generally is better. Andrew has a team of people dedicated to the creation of sets. At busy times, the Hinch Plant team could have up to five sets on the go anywhere in the UK, as well as modifying or producing kit back at the farm.

Films, either at the cinema, on TV, or on DVD at home, are increasingly popular today. Success at the box office, particularly if it becomes global, can generate a lot of money very quickly, so the film and TV industries are prepared to invest a lot of money in film-making. Each year many new ideas are put forward and those that are successful in getting the necessary funding e.g. Middlemarch, are made into films. Most productions are connected to a film studio or a film company, or a broadcaster such as the BBC in the UK. Some are made by groups of specialists who come together to form a company which is wound up when the film is finished. Making a film for TV or the large screen involves large numbers of people, a wide range of unique skills, lots of resources and plenty of money.

Hinch Plant provides many of these skills and has become a specialist contractor to the film and TV industry, playing its part in creating the sets on which the action takes place. Their key areas of expertise are the making and laying of road surfaces and making structures to create or enhance film sets according to the required period in history or in the future. They also modify and build mechanical equipment, where there is a specialist requirement.

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Other sets may be created, filmed and dismantled, all in one day. These are usually where a certain scene needs to be filmed in a specific location and in some circumstances, permission from the local authority may have been granted only for a certain time span. It may be in a city centre, stately home or out in the countryside. Hinch Plant then takes all the necessary equipment and materials, and creates the set early in the morning before filming begins.

The actors then appear in costume, cameras roll, and scenes are shot and re-shot as many times as it takes for the production manager and film director to be totally happy. Even during filming, adjustments may have to be made or changes made to the set, as well as to the acting. Once filming has finished, the location managers have the responsibility to ensure that the whole area is restored to its normal state. All the contractors are re-called to undo their work to the satisfaction of the location managers before the restoration can be signed off.

Wherever filming takes place, Hinch Plant could be involved if their services are needed, though their work, so far, has been mainly in the UK. They have worked in studios such as Ealing, Elstree, Pinewood and Shepperton, as well as outside locations ranging from the sea cliffs of Dorset to the Highlands of Scotland.

Productions in which they have been involved include:

Farmers and growers have always been very resourceful, turning their hands to many things as economics and fortunes change. Diversification can mean making the most of whatever opportunities come along. Although growing crops such as sugar beet is still the main focus for Andrew Hinch, diversifying into the film and TV arena has been an interesting departure, challenging and rewarding. If Middlemarch had not been filmed in Stamford twenty years ago, things could have been very different.

Acknowledgments
The author would like to thank Andrew and Allison Hinch for their help in writing this article and for supplying some of the photographs.
The Norfolk Farm Machinery Club

The years after the Second World War must have been a fascinating time for anyone interested in agriculture. The war was over, but the war against hunger and famine amongst the home population was far from over and rationing was as tight as ever. Farmers were much respected for pulling themselves out of the doldrums of the 1930s recession and embracing technology to produce record yields of arable crops. Chemical weed killers such as MCPA had just been developed for use on farms and any form of new technology was eagerly taken up by a farming industry, which, for once, had money to spend to develop these ideas further. The 1947 Agricultural Act also gave them a sense of security with guaranteed prices for the foreseeable future.

By Chris Thomas, The Norfolk Farm Machinery Club

Perhaps the greatest change occurred with respect to farm machinery. With the imports of American tractors and machinery under the Lease-Lend scheme during the war, farmers were suddenly becoming aware of the benefits of machinery; faithful Dobbin was gradually retired and replaced with horsepower in the form of the paraffin-fuelled internal combustion engine.

Initially, most tractor-drawn implements were adapted horse implements, the shafts being replaced with a drawbar, but the fledgling agricultural machinery industry was quickly developing implements and machinery with a far greater output. With the introduction and general use of chemical weed killers, farmers and their men had to get to grips with sprayers, and of course, later in the season, binders were being replaced with combines, which meant that the whole harvest was done and over in the field in which the crop was growing; no need to cart it off for threshing.

All this new technology had one big drawback. The farmer and his men suddenly had to become amateur scientists and mechanics. All this new machinery had to be maintained, repaired and serviced. Many farm labourers were quite used to horse harness, leather and buckles, but the internals of a combine of the time was a whole new world! They needed some kind of association they could belong to; to help educate them in the safe use and simple maintenance of the machinery they were asked to operate.

In January 1946, members of the Norwich branch of the Institute of British Agricultural Engineers (IBAE) discussed a proposal to form a practical club for farm machinery operatives and a small sub committee met at Dereham that month to develop the ideas further. This group consisted of Ben Burgess, J.C. Mann from the Norfolk Agricultural Station at Sprowston, Mr. R.R. Wright and Mr. J.R. Ware.

The club was to be known as The Norfolk Farm Machinery Club, and it had three main aims:
1. For the promotion of education and technical instruction in connection with all branches of farm machinery.
2. For the study and development of agricultural machinery and plant.
3. To organise practical demonstrations, competitions, etc, to further the interests of the members of the club.

It was agreed that an inaugural public meeting should be held in Norwich, followed by monthly meetings held alternatively at Norwich and King’s Lynn, and then at other centres around the county as the need arose. Winter meetings would consist of a visiting speaker, followed by a discussion. Summer meetings would be outside events, demonstrations, competitions and outings to places of interest to the membership. The first meeting was held at the Electricity Building, Duke Street, Norwich on Saturday 9th March, 1947; 40 people paid 5 shillings to become members. Mr. W. Newcombe-Baker from Sedgeford took the chair and Mr. J.E. Cleveland was appointed Hon. Secretary and Treasurer. The following meeting should have been held at the Duke’s Head at King’s Lynn, but the proposed speaker could not come; however a demonstration of row-crop work on a field of sugar beet at Gayton during the afternoon did go ahead, and the well known authority on farm machinery, Mr. Claude Culpin

Holt Centre on a tour of farms in Scotland.

By Chris Thomas, The Norfolk Farm Machinery Club
gave a commentary on the various items of row-crop machinery from a loud-speaker van. The operators with the best work were awarded prizes of £3 and £2, and a report on the event was sent to the I.B.A.E. (but it was sent back because it was too critical of some of the machines demonstrated).

In September, members undertook a tour of bin storage and farm grain driers in the Docking area when a number of well-equipped mechanised farms were visited. Remember that combines and bulk handling of grain were very new then, probably no more common than satellite guidance systems are today. By now thoughts turned to establishing centres in other towns within the county, and meetings were held in Aylsham, Docking, Watton and Attleborough.

The first ‘Top Link’, the members magazine, was published in July 1948, and ever since has kept members informed on the programme of events, talks and demonstrations held by the individual centres, as well as news of new machinery, new techniques, safe operating and a ‘Who’s who’ in the machinery trade. For many years it was published monthly and always had a diary page where all the individual centres would publicise their programmes so that members from other centres could attend their events if they wished. Even today, if a member wanted to go to every NORMAC event in one year, he would have to go to nearly 100 events.

At various times since the early days, other centres have been established in towns and villages throughout the county, and sometimes for all sorts of reasons some have disbanded or merged with neighbouring centres to form a more viable group. The membership subscription has always been kept low thanks to funding initially from MAFF, Norfolk County Council, and a healthy grant from the Royal Norfolk Agricultural Association. Over recent years external funding has mostly dried up and the club is just about self-sufficient, due mainly to the successful NORMAC Demo which is held biennially.

NORMAC members are a practical bunch, and have, over the years organised many practical demonstrations of farm machinery covering every aspect of arable and livestock farming. In the early days demonstrations and competitions of inter-row hoeing and mechanical gapping in sugar beet were popular days, but since then all farming operations have been covered. These include muck handling and spreading, silage making, straw handling, combines, balers, trailers and seed drills, as well as the tractors to pull them. Workshop equipment and techniques have also come under the spotlight too, with particular emphasis on safe operation. NORMAC members have also helped in research into the operator environment and comfort, with the results leading to better, quieter safety cabs.

With the decline in livestock farming in Norfolk over the years in favour of arable production, the NORMAC Demo has tended to concentrate on cultivations and now is eagerly awaited by farmers wanting to see cultivating and drilling equipment in soils similar to their own, with a possible view to purchase. Equally, the farm equipment manufacturers and dealers are very keen to attend to show their machinery. Static show stands have also become popular with the smaller ancillary suppliers, and this area of the demonstration has grown considerably over recent years. Now the demonstration site has to cover over 80 ha to accommodate all the companies wanting to exhibit with plots big enough to show off their large machines to their best. The event is biennial, alternating with the Suffolk Farm Machinery event, ‘Power in Action’. In the ‘off’ year a ploughing match is organised somewhere in the county, which attracts ploughmen from all over the country.

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Sugar beet farmers invited to join local discussion groups to explore soil management issues

BBRO and Smiths Gore have teamed up to provide sugar beet growers with the opportunity to discuss the issues affecting soil management with industry experts and each other, with a view to improving the yield of sugar beet and other crops.

Over the summer BBRO and Smiths Gore initiated a programme of intensive training for all British Sugar's area managers. This training has seen them review the basic soil management issues, identify the key parameters affecting soil structure, and explore solutions to better soil management.

During the next few months, area managers will facilitate local discussion groups consisting of sugar beet growers. The final topics for discussion and the format of the discussion groups will be decided by group members and the overall aim is to provide sessions led by leading industry speakers, including visits to look at issues such as organic matter, precision farming and cultivation techniques. It is expected that each group will meet four times over the winter with initial events having taken place during September and October.

Colm McKay, Agriculture Director, BSUK said “British Sugar wholeheartedly supports the work of BBRO and Smiths Gore in developing this initiative. I see this as a great opportunity for sugar beet growers and British Sugar staff to learn from each other, as well as from industry specialists. I am very excited about it, as I know our team of area managers are, and I am confident the growers involved will also view the initiative very positively.”

Colin MacEwan of BBRO said “The BBRO believes that by working directly with industry experts and farmers in small discussion groups farmers are able to engage more effectively with technological developments across the beet crop. Smiths Gore has the experience in developing and implementing knowledge exchange programmes across the agricultural supply chain, and this experience has ensured that the discussions groups are ready to start during this month.”

Ruth Digby, NFU Chief Sugar Adviser said “The NFU is very pleased to see such a positive programme of support from BBRO and Smiths Gore. By combining the knowledge of farmers growing the crop coupled with the external expertise this programme will provide a welcome contribution to the knowledge and tools on how to improve soil management for all farmers who engage with the discussion groups.”

Taking part in the discussion groups is easy – just contact your area manager who will explain more about the group they are setting up. If you are unsure who your local contact is please contact BBRO by phone on 0330 33 555 33 or e-mail colin.walters@bbro.co.uk

Rileys to hold major sugar beet demonstration

J Riley Agri are delighted to announce a major sugar beet harvesting demonstration to be held on 8th January 2014. The return of Riley’s famous biennial event, this promises to be the largest ever with a huge range of machinery in action.

The state of the art Vervaet Beet Eater 6-row harvester range will be on show including the four-wheel Beet Eater 617 with 17-tonne tank and the flagship Beet Eater 625 six-wheel machine with a 25-tonne capacity tank. Working with the harvesters will be the five-wheel Vervaet Hydro Trike XL fitted with a 25-tonne capacity Panien beet chaser body.

In addition, weather permitting, the Valtra tractor range will be demonstrated working with Kuhn machinery for which Rileys are now the dealership for the Norfolk area. All of this plus the ever popular hog roast!

The event is to be held at Top Farm, Great Witchingham, Norfolk by kind permission of Mr Edward Jones. Signs will be in place on the day, and for the exact location of the field please see our website (www.jrileyagri.co.uk) nearer the time.
Second fully refurbished Vervaet for Suffolk farm

Suffolk-farmer James Forrest of R H Forrest & Co took delivery of a fully refurbished Vervaet Beet Eater 617 harvester this autumn from sugar beet specialists J Riley Agri (the second refurbished Vervaet to be run by the farm).

“We were considering a smaller machine, and on the way to look at one called in to see Jeremy Riley on the off chance,” says James. “I was impressed by his helpful, sound advice. We hadn’t considered anything quite that big, but the Vervaet was already very well proven in this part of Suffolk with several people running them successfully.”

“Our trailed 3-row Thyregod was a super little machine but lacked the capacity we required. So after negotiations we decided on a five year old Vervaet 17-T, refurbished to a high standard. We’re not sugar beet contractors, but we like to be able to lift our own beet at the optimum time and do a small amount of contract lifting for near neighbours,” explains James.

The 17-T proved to be the ideal harvester, and after five seasons it was replaced this year by a 2010 Beet Eater 617, again fully refurbished by Rileys.

“We were conscious of the fact that the old one had done 10 seasons. I had asked Jeremy to keep an eye out for a good machine, and although it was a little younger than we anticipated we were pleased to make the change, and are now enjoying all of the improvements it has brought,” says James.

“In particular we think the mulching topper is brilliant. It mixes the tops in well and the soil dries out quicker on top. It makes an immense difference to subsequent following cultivations, it’s a big plus.”

In addition, the harvester is one of six in the UK fitted with the optional rear press wheels. These are used to consolidate and level the area between the wheels for an even field finish, especially in arduous conditions.

“It hasn’t really been wet enough to give the wheels a try yet, but as they were on there we decided to give them a go. We’ll see how we get on with them,” comments James.

The harvester is operated by Rob Hale, who is also pleased with the updates that came with the younger machine.

“We were delighted with the first Vervaet. It was superbly reliable, no doubt helped by having Rileys service it each year – you can count all of its breakdowns on one hand. We stuck to something we were pleased with.”

“As well as the topper there are lots of subtle improvements on this one. The work rate has increased with this harvester’s slightly faster forward speed. It’s quieter in the cab, with more information on the display, the steering control is better, especially with the share sensing, and the depth control is also improved,” notes Rob.

In addition, James is extremely pleased with the service he has received from J Riley Agri.

“Jeremy is totally straight forward to deal with. His company is a good reflection on how he is and how he likes to do business.”

“Service is second to none. Rileys know Vervaet harvesters completely – service manager Harry Skeet’s knowledge of the machines he’s looking after is amazing and they’ve got excellent mechanics,” he adds.

“When we had it we decided to have Rileys come and do the winter overhaul so we can make better use of our time. We know it will be done properly and ready to go when we want to start.”

The harvester is fitted with the optional rear press wheels which consolidate and level the area between the harvester’s wheels for an even field finish.

Fully-refurbished by J Riley Agri, this 2010 Vervaet Beet Eater 617 is the second reconditioned Vervaet harvester to be run by R H Forrest & Co in Suffolk.

The harvester is operated by Rob Hale, who is also pleased with the updates that came with the younger machine.

“We were delighted with the first Vervaet. It was superbly reliable, no doubt helped by having Rileys service it each year – you can count all of its breakdowns on one hand. We stuck to something we were pleased with.”

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Agrifac UK to import HOLMER machinery

HOLMER sugar beet harvesters, loaders and systems tractors will be imported by Agrifac UK from March 2014 with a view to improving parts and service support to customers.

The EXEL Industries Group are world leaders in sugar beet harvesting, cleaning, loading and transport machinery. The EXEL Group who acquired the Agrifac company in July 2012 and the HOLMER company in March 2013 is looking to invest heavily in the UK with larger premises, additional staff and better facilities with the focus on improving service for its customers in this important market.

The EXEL strategy for Agrifac UK at their head office in March, Cambridgeshire is to boost sales and improve market penetration as part of a realignment of its worldwide business and distribution network.

The German HOLMER manufactured range of machines includes the Terra Dos T3, 2-axle, and Terra Dos T4-40, 3-axle harvesters, the Terra Felis 2 sugar beet loader, and its Terra Variant 600 systems tractor with various demountable bodies for sugar beet chasing, slurry injection, etc.

The complete range of harvesters from the EXEL Group will be rebranded ‘HOLMER-exxact’, with Agrifac incorporating smaller and larger machines above and below the existing HOLMER range.

The existing importer, Standen-Reflex at Ely will continue to provide UK service and parts for HOLMER products until the end of the 2013/2014 sugar beet harvest.

Further information available from Andy Carse (Director) Agrifac UK, 1 Martin Avenue, March, Cambs PE15 0AY. Tel: 01354 660552 www.agrifac.co.uk

Beet Harvesters in Britain

Chris Lockwood claims this DVD twin set to be ‘the most thorough on beet harvesters ever’. In total, some 75 machines are featured over the two discs, which include examples from almost all the beet harvester manufacturers whose machines sold in the UK in recent decades.

The majority of the machines in this 2-DVD set are shown at work in all weathers on farms, and were filmed specifically for this programme by Chris Lockwood.


Part 1 covers the development of beet harvesters from 1960 to the mid-1990s. It documents the changes, firstly, from trailed single-row side-elevator harvesters on to multi-row trailed machines, deals with early self-propelled harvesters and finally with the more recent six-row tanker machines.

Part 2: 1995-2012

Part 2 focuses on the advances in harvester design of the past fifteen years. Tanks are larger and there are more axles to spread the massive weights involved. The machines handle an increasing number of rows with far more technical monitoring.

The programme also covers the recent trend towards specialised ‘beet chasers’ in the field and self-propelled cleaner loaders. An extra feature looks at the Vervaet factory and the company’s history.

Beet Harvesters in Britain: Parts 1 and 2 –

Now available on DVD from Old Pond Publishing.

Running times: Part 1: 105 minutes; Part 2: 115 minutes. Priced at £16.95 each or £31.95 for the set.

Order direct from Old Pond Publishing on 01473 238200 or www.oldpond.com
Influential night for British Sugar at Farmers Weekly Awards

The annual Farmers Weekly Awards again provided a fantastic opportunity for British Sugar to sponsor the Arable Farmer of the Year Award as well as recognise the UK beet sugar industry with key growers and industry contacts.

This year’s winner was Jeremy Oatey whose Agricola farm business based in Plymouth produces a wide range of crops, including high value vegetable and bulb crops. Jeremy impressed all of the judges with his drive and determination which has allowed him to become a ‘first generation’ farmer and developed a strong promotion and marketing plan for his business to access high value markets.

The award was presented by Colm McKay, British Sugar agriculture director, at the ceremony which was hosted by Kate Silverton on 3rd October at the Grosvenor Hotel, London.

British Sugar’s attendance at the awards ceremony included a guest list of 40 key growers, NFU and senior British Sugar agriculture members who had a great opportunity to build new business relationships and share an optimistic vision of farming and sugar beet production.

Runners up to the award, including sugar beet grower Tom Dye, joined the group, as well as last year’s winner, Guy Poskitt, who both made sure that sugar beet growing was well represented.

A further special award ‘Farming Champion of 2013’ was presented to Newark grower Andrew Ward for his selfless act of generosity when he launched a campaign to get free forage to snow-hit farmers following the snowstorms in March.

Richard Pike, British Sugar managing director, was at the event and commented, “I was proud to see British Sugar so prominently represented at the awards and delighted to meet and spend some time with key sugar beet growers and industry stakeholders. Our relationships with growers are essential for the future prosperity of the UK beet sugar industry”.

Left to right: Jane King (Farmers Weekly editor), Jeremy Oatey, Colm McKay and Kate Silverton (BBC reporter and presenter).

Andrew Ward, Newark sugar beet grower and 2013 ‘Farming Champion’.
news

Dal-Bo: Offering you a wider choice

Launched to meet the demand for a precision seedbed cultivator that is suitable for tractors from 150 hp to 600 hp, the Danish manufacturer Dal-Bo has designed the Rollomaximum.

The Rollomaximum, which is available in 4 working widths – 6.2 m, 7.5 m 9.3 m and 12.4 m – is a trailed precision seedbed cultivator specifically designed to meet the demands of the UK sugar beet growers. With tractor horsepower continually increasing the company felt there was an opening in the market for wider working models. As many growers look to cover their acreage at the optimum time, Dal-Bo is confident that the 9.3 m and 12.4 m models will appeal to the larger grower and contractor.

At the moment this market will not be as big as the 6.2 m and 7.5 m one but as early interest has shown there is a definite need for the wider working machines.

All models are fitted with either a front leveling board or hydraulically adjustable cracker board, followed by either a cast crosskill or cage roller. Next there are four rows of heavy duty spring tines with the straight tine being the preferred choice in the UK. After the tines is a leveling board and the job is finished with either a cage or steel crosskill roller.

The Rollomaximum uses some of the technology from the company’s range of hydraulic folding rolls to ensure even and precise cultivation across the full working width. This is achieved via accumulators and heavy duty rams that transfer weight to the side sections ensuring even soil pressure across the full working width, which creates an ideal seedbed to drill into.

All models in the Rollomaximum range fold hydraulically to a transport width of 3 m.

For more information please contact Steve Atkin at Dal-Bo UK on 07769 643319.

Drill testing in preparation for the 2014 crop

In preparation for the 2014 sugar beet crop it is worth remembering the importance of having your sugar beet drill tested.

Why have your drill tested

- For an average 2,000 tonne crop, it has been suggested that the loss of revenue resulting from poor drilling practice could be as much as £6,000.
- Having a well maintained and adjusted drill is essential to ensure good plant establishment and crop uniformity to achieve maximum yields.
- Poor drill performance can lead to reduced plant populations and increased losses at harvest.
- Sugar beet drills should be tested at least every two years.

Arranging to have your sugar beet drill tested

All growers and drill contractors have been sent details of all the available drill test centres. If you have not received a copy details have been published on the British Sugar Beet Portal (www.bsonline.co.uk).
Outcome of investigation into the abnormal emergence of the 2013 Sugar Beet Crop

“As part of this investigation we developed a stress test that mimicked, as closely as possible, the unprecedented and prolonged cold temperatures experienced earlier this year,” said Dr. Gerard Mulqueen, Germains Business Unit Director for Sugar Beet. “Our investigation indicated that the combination of the very cold temperatures and the amount of time seed and seedlings were exposed to these low temperatures, had a considerable impact on sugar beet emergence.”

“The launch of the new pellet, Xbeet® plus (which combines the long established Xbeet® priming used since 2009 with an enhanced pellet technology) for the 2013 sugar beet season, coincided with one of the most extreme weather events seen in the UK and across Western Europe. The unusually cold conditions, combined with high winds and following a particularly wet winter harvest, had a significant impact on the sowing season across the region.”

“The results from the assessment suggest, that under extremely cold, dry and stressful conditions, primed seed is more beneficial than unprimed seed. The results also show that Xbeet® plus continues to offer a significant benefit over and above Xbeet®, even under cold, dry and stressful conditions,” said Gerard.

Dr. Mulqueen confirmed that “Germains will continue to work closely with the BBRO, NFU and British Sugar to provide enhanced guidelines for drilling the UK sugar beet crop in challenging conditions.”

Germains takes pride in delivering a high quality sugar beet seed package to UK growers. At our site in King’s Lynn we prime, pellet and coat the sugar beet seed, carefully maintaining the quality and integrity of the seed genetics, provided by the seed breeders, throughout the process,” said Gerard.

More information and further details of the investigation can be found by visiting Germains website www.germains.com/our-technologies/sugar-beet/xbeet-plus
UK sugar beet industry leads the way to a sustainable future

On 14th November key representatives from the UK beet sugar industry attended a practical on-farm event in Lincolnshire to highlight the benefits that the sugar beet crop brings to the farmed environment. The event was attended by representatives from Natural England, British Sugar and NFU Sugar, along with key sugar customers, ensuring the industry whole supply chain was represented.

Host farmer, Mark Ireland, demonstrated various environmental initiatives that show how commercial farming can operate in harmony with the environment. Highlights of the event included:
- Species rich grassland areas
- Arable options for birds
- Buffering of the High Dyke Site of Special Scientific Interest with grass margins
- A conservation site of a medieval settlement and field system which is protected under HLS grassland management
- Curlew and lapwing favourable cereal stubbles and species rich areas with cowslips, plantain, yarrow, knapweed and yellow rattle.

There is a recently added array of solar photo-voltaic panels above the farmyard. Rainwater harvesting from the farm buildings is used to supply all the water for crop spraying. On the southern boundary an historic ridge and furrow feature is protected under grassland and maintained permanently. There are also bird mix and stubble options to protect and enhance the existing bird population.

Poul Christensen, Chair of Natural England said, 'The challenges of combating global climate change, reducing environmental impacts and increasing the efficiency of food production for a growing population are very real for the UK beet sugar industry and it can feel justly proud of the progress it has made over recent years.'

The UK beet industry already has a credible track record of sustainability achievements. Pesticide and fertiliser use has dropped by between 40% and 70% since 1982 and yields have increased by 60% in that time. Over 85% of all sugar beet in the UK is grown within one form of environmental scheme or another, the bulk of which is ELS, but also HLS, LEAF and remaining Countryside Stewardship.

Richard Pike, Managing Director of British Sugar said, ‘In our factories we are also making more from each root of beet. Energy consumption per tonne of product has fallen by 25% since 1990 and a diverse range of co-products are generated to maximise efficiency; from tomatoes to animal feed and topsoil to electricity. All these activities make a positive contribution to the Government’s drive for sustainable agriculture and environmental protection.’

Funded jointly by beet growers and British Sugar, the UK also boasts one of the leading sugar beet research programmes in Europe delivered by the BBRO (British Beet Research Organisation). Over £2.0m is invested annually in research, development and education. The programme develops innovative supply chain solutions based upon independent scientific research and enables the industry to respond efficiently to market and regulatory changes.

Members of the industry group discuss the merits of sugar beet in terms of biodiversity and sustainability.

Following brief introductory presentations from British Sugar, Natural England and host Mark Ireland, the group toured field margins close to the farmyard, followed by a trip around the farm to see sugar beet harvesting and loading at the clamp. During discussions over lunch, which followed the tour, there was broad agreement amongst the group that in future sustainability would be a key plank of everything the sugar beet industry needs to do to promote and underline to a wider audience of consumers and external stakeholders the importance of the crop.

Left to Right: Richard Pike, British Sugar MD; Richard Allison, Farmers Weekly Arable Editor; Ruth Digby, Senior Adviser NFU Sugar; Adam West, Natural England; James Ireland, host grower; Robert Law, Vice-Chairman NFU Sugar; Natalie Ritchie, Senior Manager Sustainability for Mondelez; Poul Christensen, Chair of Natural England; Amanda Curtis, Environment Manager Coca Cola NW Europe; Mark Ireland, host grower and Alan Mayo, British Sugar Head of External Stakeholder Development.
Campaign progress 2013/14

It has been an excellent start to the processing season; at the time of writing this article the factory has been continuing to slice well above target. Budget throughput was achieved on day two, which has never been achieved before. By mid-November the factory had only had three days below budget throughput. The average daily slice rate after the first 60 days is around 14,500 tonnes per day. At the start of the campaign a problem was identified with the jet engine in the boiler house, so the engine was replaced within the first few days: this did not impact on factory throughput. The only other major event until mid-November was a problem with the boiler. Steam was being vented high up on the boiler and originally it was felt this could stop the factory for a few days. The repair finally took around 12 hours, which included shutting the factory down in a controlled manner. Stopping the factory in this way enables a much faster start-up once the repair had been completed. The main reason for a quicker repair was the fact that the repair could be completed from outside the boiler by cutting a 'window' in the casing.

Crop yield

Finished growers to date have shown a range in yields of 48 t/ha to 91 t/ha adjusted. This is a slightly higher yield compared to this time last year. Sugar content is holding firm at around 17.3% and has been at this level for a number of weeks. The sugar content pattern this year is very unusual; the first few weeks increased as expected. Thereafter the weather changed to be wetter and the sugar content dropped sharply for a further three weeks and then increased again. I believe that due to the very mild October weather we have experienced considerable late season mineralisation of nitrogen which, in conjunction with wetter weather, has caused the crop to grow significantly over this time. Crops have looked deep green in colour well into the autumn indicating a very healthy crop that is still growing. I would expect sugar content to have a much flatter profile this year from now on, as is usually the case with a lower sugar content at the start of the season.

Whole beet delivery

The crowning standard across the beet being delivered to the factory this year shows that the vast majority of growers are taking advantage of more paid yield by leaving most of the crown on the root during harvesting. Clamps on farms do now look ‘greener’ and contain more stalk, but this is usually rubbed off during loading and a much lower volume is seen at the factory. Any loads that are seen to have been overtopped are monitored at beet reception and growers are advised that they may be losing crop yield as a result.

Co products (LimeX70, Topsoil, Stones)

LimeX70 despatches from site are progressing, as growers use the advantage of cheaper backloads while beet is being delivered during the campaign. LimeX70 sold out again last year. Just under 70,000 tonnes of Topsoil products were despatched from Bury factory prior to campaign start and 50,000 of stock is now ready for the supply over next winter and early spring. A new soil elevator is now being used to stockpile final product under cover in the soil sheds. This had given the advantage of using the full height of the sheds and doubling our storage capacity. The main soil and water pond was excavated throughout last summer to a greater extent than ever before. Washed stone is not available from the factory this year due to running problems with the stone washer. This equipment will be replaced next off season.

Best wishes for the rest of the campaign and for the festive season from everyone in the Bury St. Edmunds agriculture team.

Dan Downs
Agricultural Business Manager
Crop progress

It is late November as I write and crop yields have improved significantly since the start of campaign, due to the mild conditions persisting until mid-November when the first significant frosts occurred. Sugar content has gradually improved over the last eight weeks and now sits around average for the time of year.

Harvesting is progressing well with a good standard of defoliation and general quality of deliveries. Please use the revised whole beet delivery chart and advice from your area manager to maximise your delivered yield. Anyone contemplating long-term beet storage should plan to ensure minimal storage losses. It is better to long-term store beet which are disease-free and harvested under good conditions than continue just-in-time delivery of later-lifted beet. However good you believe the clamp to be, monitoring for overheating and protecting with clamp sheets when frosts are forecast is essential.

Factory

Installation of the new evaporator facility and a pre-scalder is progressing well and on target for availability for the 2014 campaign. By the time you read this we will have received the new evaporator vessel which is to be delivered by a 400-tonne river barge and erected next to the steel work shown in the photograph top right.

LimeX and Topsoil

At Cantley we offer Landscape 20 Topsoil, as well as LimeX45; call your area manager for details and to place your order. We have graded stone available (20-40 mm and 40 mm plus) and ash (often used to top off farm tracks etc.), details are available from Patrick Barraclough on 07769 936994 or www.limex.co.uk or www.bstopsoil.co.uk

BBRO 4x4

I’m sure you are all aware of the industry 4x4 initiative, area managers are keen to help you review your crop management plans to help identify opportunities; learn from others and capture more yield to improve beet margins. I wish you a successful completion to the 2013 crop year and hope your preparations for 2014 drilling are going to plan.

John Emerson
Agricultural Business Manager
Now in the tenth week of campaign, the factory has been performing well and with the very mild autumn to date, crop growth has been enhanced.

Factory

Over the course of the campaign our aim is to achieve an average daily slice of 8950 tonnes per day, this season with our new falling film evaporators working for the first time and performing well, we have managed to achieve an 8% higher throughput.

With the drier weather at the start, harvesting conditions were exceptionally challenging, resulting in clods and stones being lifted with the beet. This did result in us experiencing fluming difficulties on a number of occasions. It is a timely reminder to always fully utilise cleaner loaders to ensure unnecessary soil is not hauled to the factory resulting in higher dirt tares.

During our first six weeks, in order to keep the factory supplied with beet, and with haulage being at a premium at that time (judging by the number of permits being missed), we had to call high - mostly around letter ‘T’. Now everyone is fully delivering we have settled back onto the standard call-up of ‘L’. Latterly the factory has not been slicing as hard and we have been experiencing some challenges with pulp drier performance; these have now been overcome.

Looking to the future, our major improvement project will be the replacement of our centrifuge station in the sugar-end of the factory. We look forward to the benefits that will bring.

Crop

During the dry hard conditions at the start, although everyone responded very well to continuing to maximise the crown delivered with the beet, root breakage was a cause for concern in a number of cases. Once the rain arrived in mid-October conditions improved considerably and with better harvesting combined with more growth, there has been a noticeable increase in yields.

It is good to see the lack of disease in the crop following the on-going use of two fungicides for later lifted beet. Growers are now reviewing their storage/ harvesting strategy for the remainder of the campaign (likely to run until early March), in line with BBRO advice, to ensure the crop is managed effectively and yields maximised.

With good autumnal growing conditions we are expecting to exceed our five year average yield here at Newark. Currently 75 of our growers have reported completion of deliveries; they grow 5% of our total crop and have delivered 119% of contract.

Co-products

Both Topsoil and LimeX continue to be despatched to customers. Offtake on the former since campaign start is very similar to last year. On LimeX, demand has already been double that of last year; no doubt the better weather conditions have helped. The attraction of lower haulage rates back-loading to farm will also be a factor. Together with the good storability over the winter period, many more of our customers should be considering this lower cost option for future liming requirements, particularly with the extra fertiliser elements in LimeX, adding to the benefits.

David Dunning
Agricultural Business Manager
The low level of rainfall during the summer months meant that lifting conditions were not ideal at the start of the campaign. However, a spell of rain just before the factory opened on Monday 16th September did ease the dry, hard conditions somewhat. Roadside stocks soon built up and the first beet was sliced on Tuesday 17th September. Field conditions soon improved with higher rainfall levels recorded throughout October. Sugar contents started at 16.6% and soon climbed during the first four weeks of campaign until the October rainfall slowed the trend. Levels peaked at around 17.8% and have remained at a similar level over recent weeks.

Beet supplies have not been an issue at Wissington, although during the first couple of weeks we had to move some delivery slots around from the areas that were struggling to lift. Wissington factory also took in a small amount of beet from Cantley growers during the first week following their later campaign start.

Despite a delayed start to drilling and some difficult weather conditions in the spring, crop yields are looking encouraging in many areas; this is as a result of the very good late-season growth over the last few weeks. The crop is still looking very healthy with a good canopy in most fields. The relatively mild September and October combined with appropriate fungicide strategies have resulted in some reports of very high root yields and high sugar contents. Harvesters should be checked and adjusted to ensure that as much of the root is delivered as possible. Area managers are available to give advice on whole beet delivery parameters and will be able to assist in checking your current levels of crowning.

Longer term storage clamps are now starting to be built and it is important to protect the yield that you have gained over the past eight months; guidelines on construction of these clamps can be found on www.bsonline.co.uk or contact your area manager for advice. Clamp sheets are available for delivery from the Agricultural Helpdesk (0870 2402314). Please take care when planning your clamp positions. On average, five people a year are killed at work, and many more are seriously injured, when they come into contact with live overhead electricity power lines (OHPLs). If a machine touches or gets too close to an overhead wire, then electricity may be conducted to earth which may cause a fire or explosion and electric shock to anyone touching the equipment. An overhead wire does not need to be touched to cause serious injury as electricity can sometimes ‘arc’ or jump across small gaps. Increasingly, we are seeing beet clamps stored too close or underneath power lines. This is extremely dangerous and should be avoided at all times. The safe distance should be at least 10 m. If in doubt contact the electricity provider. Do not take a chance as it could prove to be fatal!

The factory had a few power issues in the first few weeks of operation but has now settled and is consistently slicing over 18,000t/day. Daily slice rates can be found on www.bsonline.co.uk

The Wissington Agricultural Team is currently running a series of Soils Club meetings across the beet growing area. Good soil management is the cornerstone of producing a high yielding crop. In partnership with DEFRA and the European Rural Development Fund, BBRO have funded a series of meetings focusing on helping growers to improve their soil management, and drive crop yields throughout their rotation. These have taken the form of smaller discussion groups where growers will be able to contribute as well as learn from an expert. If you would be interested in getting involved in the next round of meetings then please contact your area manager.

Andrew Dear
Agriculture Fieldstaff Manager
• Special recommendation for AYPR Rhizomania
• Double rhizo resistance – Rz1 + Rz2
• High yield outside of infestation – 99.2%
• Very high sugar content – 18.73%
• Overcome Rhizomania with Sandra KWS

Data Source: BBRO Sugar Beet Recommended List 2014

www.kws-uk.com