DIE SUID-AFRIKAANSE INSTITUUT
VAN LANDBOU-INGENIEURS

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CFL's IN KWEEKHUISE

Deur
Neels Bezuidenhout (Pr. Ing)

Die afgelope jaar is daar baie onderhandelinge tussen Eskom en Nersa oor die voorgestelde verhoging in elektrisiteitspryse vir die volgende 3 jaar. Met die skryf van die artikel was die finale prysverhogings nog nie vasgestel nie. Hoe dit ook al sy, die prys van elektrisiteit gaan verhoog. Dit gaan vir onder andere die Landbou-ingenieurs nuwe uitdagings bied om innoverend te dink en geleenthede skep om landbou produsente te konsulteer met nuwe idees om elektrisiteit te bespaar deur prosesse te optimaliseer, nuwe tegnologie aan te wend en moontlikhede van alternatiewe energieë te gebruik om nie net hulle energiekoste te verlaag nie, maar ook om die vraag op Eskom se nasionale netwerk te verlaag.

In ons soeke na oplossings, het Leon Pretorius van Pretorius Blomme op Delmas ons genader om te kyk na die moontlikheid om sy konvensionele 100W gloeilampe te vervang met CFLs (Condensed Fluorescent Lights).

Pretorius Blomme kweek hoofsaaklik krisante onder 2,5 ha kweekhuistonnels en maak gebruik van 1000 ligte. Indien die totale kweekhuis van 2,5 ha belig sou word, sou 3 700 ligte benodig word maar as gevolg van kabeldiefstal, word slegs 1 000 ligte elke 21 dae geroteer.

Die lux benodig vir Krisante is ongeveer 85 tot 90 direk onder die ligte om 'n ideaal van 70 lux by die plantjies, tussen twee ligte te gee wat ongeveer 1,9m hoog geïnstalleer is.

Met ons aanvankilke toetse het ons slegs die langwerpige 20W CFL tot ons beskikking gehad en het ons gevind dat die CFL te lank was vir die lampskerm en dat ons ongeveer 15% lux verloor het. Hierdie ligte is later vervang met 'n 20W spiraalvormige CFLs wat die korter is en ons probleem opgelos het.

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Die CFL's kom in twee tipe ligte, nl. "warm white" en "cool white". Laasgenoemde gee 'n witter lig as "warm whites" en is volgens sekere bronne die beter lig om hiervoor aan te wend. Alhoewel die produsent sy eie toetse op 'n klein skaal tussen "warm white" en "cool white" ligte gedoen het, het hy verkies om van "warm white" ligte gebruik te maak. Ons het egter nie self die toetse hiervoor uitgevoer nie.

Resultate

Blomme

Die blomme se aanvanklike ontwikkeling is vinniger met 'n beter knopvorming. Die volwasse blomme het langer stammetjies gehad en die blomme self het meer "body" getoon as onder konvensionele ligte.

Onderhoud

Met konvensionele ligte was ongeveer 25% van die totale hoeveelheid ligte per maand vervang terwyl daar geen CFLs in dieselfde periode van toets vervang is nie. Die produsent kan sy arbeid ook nou beter benut as om voortdurend ligte te vervang.

Energieverbruik

Die energieverbruik op een blok waar 126 ligte geïnstalleer is, het 16,62 ampere per fase gemeet met konvensionele gloeilampe (ventilasie waaiers uitgesluit) en nadat die gloeilampe met CFLs vervang is, is 'n stroom van 5,43 ampere per fase gemeet. 'n Besparing van 67% op energie vir beligting.

Die ligte word in die aand met tussenposes aan en af geskakel om ‘n gemiddeld van 2,7 uur per dag te brand. Indien die ligte elke dag op hierdie wyse aangeskakel word, sal die ligte ongeveer 986 uur per jaar aangeskakel wees. Die leeftyd van CFLs is ongeveer 6000 uur en kan dit dus teoreties onder ideale toestande in hierdie geval vir 6 jaar aangewend word voordat dit vervang hoef te word.

In die geval van Pretorius Blomme, kan tussen 70 000 en 80 000 kWh per jaar bespaar word in die energieverbruik slegs deur die ligte te vervang. Alhoewel die aankoopprys van CFL’s ongeveer R20 tot R30 per lig is teenoor die ongeveer R3-50 van konvensionele gloeilampe, kan die kapitaal vir die vervanging van die ligte in minder as 1 jaar deur besparing in energie gedelg word.

Die geïnstalleerde kW op die totale kweekhuis vir beligting het verminder van 100kW na 20kW wat ‘n beduidende verskil maak op die aanvraag en kan ‘n kleiner transformator met aansienlike maandelikse besparing in die maandelikse vaste koste teweegbring.

THE LATEST IN TRANSPORT MANAGEMENT AND TECHNOLOGIES

by

Prof Peter Lyne

Transport remains a very costly element of the sugarcane and timber supply chain. Therefore, there is a continuing effort to explore all avenues to increase the efficiency and effectiveness of transport systems. Current initiatives involve, transport management systems such as, load management, vehicle scheduling, vehicle performance modelling and management, road infrastructure, benchmarking and finally the road traffic management system (RTMS) and performance based standards (PBS).

These initiatives have all produced valuable outcomes which provide tools, guidelines, information and recommendations which are all available to the sugar and timber industry. If one takes advantage of these items, the logistics of transport will be improved significantly and transport costs will be reduced. In addition, the regular supply of product to the mill which is an important indicator of a well managed supply chain, will be improved and this will benefit everyone in the industry.

Transport Management

As costs skyrocket and margins shrink, it is crucial to ensure that the transport system is well managed, this will ensure a reliable, safe and cost effective operation. There are many aspects to management and tools are available to assist to ensure optimum efficiency.

Payload management. The cost of transport is very sensitive to vehicle payload, particularly on hauls of more than 25km and there are number of systems which can be used to ensure a maximum legal payload. Cole *et al*, 2006, show results which prove that onboard weighing is a cost effective solution to the problem. They discuss this issue and give guidelines to maximise profit.

Vehicle Scheduling. There are tools available to ensure that vehicles arrive at a Mill on a regular interval and that turnaround times are minimised (Giles *et al*, 2007). This is particularly important on the shorter hauls of less than 25km. Four sugar mills in SA have introduced systems to achieve this and there is a large quantity of anecdotal evidence to show that the systems have resulted in massive benefits to the grower, haulier and miller. Other mills are seriously considering introducing vehicle scheduling systems.

Benchmarking. This is a process to ensure firstly, that one’s performance compares with the best and secondly that there is a process of continuing improvement. There is no other way of systematically improving efficiency and is a requirement if one wants to improve performance. A number of Sugar Mills use the Sugar Logistics Improvement Programme (SLIP). This was a South African Canegrowers Association (SAGCA) initiative with an objective to;

- minimise burn/harvest to crush delays (BHTCD)
- minimise costs in the cane supply chain
- improve efficiencies in the cane supply chain

SLIP has proved to be very effective and has been used to improve efficiencies and reduce costs.

There are also vehicle modelling tools such as Transolve which enable one to investigate "what if" scenarios when considering vehicle types and options and routes (HTM, 2008). Once a system has been purchased there are numerous commercial vehicle manage systems available to monitor vehicle and driver performance. There are many cases where such equipment has paid for itself in a very short space of time thereafter returning a profit for the owner.

Infrastructure

Optimum zone placement.

A very common mode of sugarcane and timber transport involves field vehicles moving product to a zone and followed by road transport which moves the product from zone to mill. Because field vehicles are much more costly per ton.km than road transport vehicles, a model was developed to optimise the location of loading zones to minimise the overall transport cost. This model was further developed into a user friendly system to simplify the task (Bezuidenhout *et al*, 2005).

Optimum route selection (FastTrack).

The cost of transport is directly related to the distance travelled and there is an example in the industry where a group of farmers worked together to provide a shorter toll road and ended up saving millions each year. A project was recently completed to investigate the opportunities of selecting and building shorter routes. The development of a selection tool and a case study by Harris *et al*, 2008, showed that there was an opportunity to select and build shorter routes that were economically viable.

Road Traffic Management System (RTMS) and Performance Based Standards (PBS)

RTMS is an industry-led self-regulation scheme which encourages operators to implement management systems that preserve road infrastructure, improve road safety and increase the productivity of the transport system. The timber and sugar industry has accepted that RTMS has real benefits and encourages all operators to comply. The benefits of implementing RTMS are reduced costs that flow from:

- a consistent maximum legal payload
- capable drivers
- well-maintained vehicles and
- a productive system.

A transporter who can show that he loads responsibly can apply to be RTMS accredited and one can see many timber transport vehicles operating on our roads with the RTMS accreditation logo mounted on the front of their vehicles. In addition, the Department of Transport (DOT) has indicated that if one embraces and complies with RTMS, one can then apply for authorisation to operate a Performance Based Standards vehicle.

Performance Based Standards (PBS). To put it into context, the current fleet of haulage vehicles in South Africa must comply with a set of prescriptive regulations which specify items such as Length, Power-to-Weight-Ratio, Axle loadings, and Gross Mass. This is an attempt to ensure that vehicles are safe, do not damage the roads and operate more economically.

However, it has been recognised that:

- These regulations do not address the vehicle dynamics and some vehicles which do comply, are not as safe as they should be.
- The current system restricts innovative design.
- The current system provides little incentive to use new technological developments.
- The PBS approach not only achieves less road damage and safer vehicles, but also vehicles are more productive (Nordengen *et al*, 2008).

With PBS, the criteria for the design is that a vehicle should conform to a set of performance standards which will ensure that less damage is caused to the roads and that the vehicle is safer than current designs.
To test the system, the Minister of Transport agreed to approve a pilot project where RTMS-accredited operators could apply to have a PBS vehicle. The pilot projects would be aimed at designing, building and operating vehicles that could carry higher payloads (e.g. 60 tons), but, which do not exceed the legal axle load limits. One can easily see the benefit of such a system (Lyne, 2007).

As mentioned, RTMS has been implemented in the forestry industry and both Sappi and Mondi have initiated PBS pilot projects. Two vehicles have been running for over 18 months now and so far they have realised an 18% saving in transport costs and the vehicles are using one litre of diesel less per ton of timber delivered. Additional pilot projects could be initiated in other industries, such as the sugar or coal industry, where the RTMS has been launched. The vehicles could be designed to suite any purpose, not only high payload, but, perhaps a product with a low bulk density where an operator might want extra load volume. This would facilitate the transport of a product such as green cane which still has the trash attached.

The pilot project designs must remain within certain parameters such as axle mass limits in order to gain acceptance from the road authorities in a relatively short period of time. The pilot project will require an evaluation period of at least three years. This will allow sufficient time to conduct proper tests and for companies to financially write off the initial investments.

In view of these initiatives, it is hoped that transporters will take advantage of the concession to develop and operate a PBS vehicle. Initial discussions have been held with some role players and an interest has been expressed. The sugar vehicle need not necessarily have extra mass carrying capacity, but, could have extra volume. Anyone keen to become involved should contact Peter Lyne at SASRI, telephone 031 508 7432.

Conclusions

Although transport costs have rocketed over the last number of year there are many opportunities to improve efficiency and reduce costs. Those listed above have resulted from research programmes and have proved their worth in practice, each one has shown the potential to save large costs and improve the supply chain in general.

References

Harris, AJ, Bezuidenhout, CN, Lagrange, LF, Lyne, PWL, 2008. Development of a sugarcane transport route planning model in a geographical information system. Proc S. Afr. Sug technol. Ass. Congress, Durban, 81:430-433.

HTM, 2008. Transolve. http://www.htm.co.za

Nordengen, PA, Prem H and Lyne PWL, 2008. Performance-based Standards (PBS) Vehicles for Transport in the Agricultural Sector. S. Afr. Sug technol. Ass. Congress, Durban, 81:445-453.

Lyne, PWL, 2007. Reducing Transport Costs. SA Sugar Journal. 91(2): 30-32.

Cole, AK, Baier, T and Lyne PWL, 2006. The Performance of Onboard Weighing Systems on Sugarcane Transport Vehicles. Proc S. Afr. Sug technol. Ass. Congress, Durban, 80:86-99.

Giles, RC, Dines, GR, Lyne, PWL, Bezuidenhout, CN, 2006. The complexities of introducing the FREDD vehicle scheduling system into the Darnall mill area. Proc S. Afr. Sug technol. Ass. congress, Durban, 80:66-70.

Bezuidenhout, CN, Meyer, E, 2005. A decision support tool for upgrading farm roads, locating loading zones and establishing cane extraction profiles. Proc S. Afr. Sug technol. Ass. congress, Durban, 79:394-401.

SAILI SIMPOSIUM 2010

28-30 September 2010

Aankondiging

Die 2010 SAILI simposium vind plaas vanaf 28 tot 30 September 2010. Dit word gereël deur die SAILI Pretoria tak en die komitee wil dit registreer by ECSA as 'n "VPO" (Voortgesette Professionele Ontwikkeling") geleentheid.Dit sal plaasvind in die Gauteng omgewing en almal word uitgenooi na hierdie belangrike Landbou-ingenieurswese gebeurtenis in 2010.
Die voorgestelde tema is:

Tegnologie en Energie in Voedselproduksie

Die "Uitnodiging vir referate" sal einde Maart 2010 uitgestuur word en vir verdere inligting kontak Piet Snyman by snymanp@arc.agric.za of 012 842 4226

SAIAE 2010 SYMPOSIUM

28-30 September 2010

Announcement

The 2010 SAIAE symposium will take place from 28 to 30 September 2010 It will be organized by the SAIAE Pretoria branch and the Committee's intention is to register it with ECSA as a CPD (Continuous Professional Development) event. It will be hosted in the Gauteng area and you are all invited to this mayor Agricultural Engineering event for 2010
The proposed theme is:

Technology and Energy for Food production

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The "call for papers" will go out the end of March and if you need further information please contact Piet Snyman at snymanp@arc.agric.za or 012 8424226

SAIAE MEETING - PRETORIA BRANCH

The SAIAE Pretoria branch held its first annual meeting on 9 February 2010 at the premises of the ARC - Institute for Agricultural Engineering, 141 Cresswell Road, Weavindpark. The meeting started at 16:15 and was attended by 32 members.

Two presentations were made during the meeting:

1. Professor Jeff Smithers from the University of KwaZulu Natal, presented a paper "Technology in Food and Energy Production Systems: Global Achievements and Challenges in South Africa". This presentation concentrated on the role the agricultural engineer/technician played in the past with regards to technology development in agriculture. Within a changing world with different demands/requirements, the challenge is even greater for the agricultural engineering discipline to satisfy these needs. The presentation of Professor Jeff Smithers is available electronically.
2. Mr Misha Mashifane on behalf of Mr K. Levin gave an overview of the activities of the private company, "Fluidra". This company is a global giant in water related products and is also listed on the Spanish Stock Exchange. Contact details: 011 314 8628/ klevin@fluidra.com

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NAMPO

Lede word graag daaraan herinner dat die Nampo Oesdag Uitstalling sal plaasvind vanaf die 18de Mei 2010 tot die 21 Mei 2010 te Bothaville. By hierdie geleentheid sal SAILI ook 'n uitstalling aanbied ter bevordering van SAILI se betrokkenheid in die Landbou Ingenieurswese. Om die nodige inligting aan die publiek te verskaf, is dit nodig dat die uitstalling beman word. 'n Versoek word hiermee aan daardie lede gerig, wat wel Nampo gaan bywoon, om indien moontlik met hierdie funksie behulpsaam te wees. Indien u kan help epos, asb u besonderhede (naam, datum en tyd beskikbaar) aan Mnr Neels Bezuidenhout by BezuidN@eskom.co.za of aan Luther Siebert by mls@iafrica.com.

Members are reminded that the Nampo Harvest Day Exhibition will take place at Bothaville, from the 18th May 2010 to the 21th May 2010. To promote the involvement of SAIAE in Agricultural Engineering, the SAIAE will have an exhibition at this event. To be able to inform the public of SAIAE activities the exhibition needs to be manned, a request is therefore made to those members that will be attending Nampo to make themselves available to serve at the exhibition. If a member wants to participate, please email your details (name, date and time available) to Mr Neels Bezuidenhout at BezuidN@ eskom.co.za or to Luther Siebert at mls@iafrica.com.

OBITUARY - G.S. Bartlett [1931/03/14 - 2010/03/25]

It is with regret that I need to inform you of the passing away of George Bartlett on 25th March 2010 after a long illness. George was a founding member of SAIAE and continued to play an active role and interest in SAIAE. He was also a prominet politician and served in the Cabinet as Minister of Mineral and Energy Affairs and also as Minister of Agriculture in the KZN Legislature. On behalf of SAIAE, I extend our condolences to his family.

Jeff Smithers
President: SAIAE

VERSOEK AAN ALLE LEDE:

(i) Om die databasis van die lede korrek en op datum te hou, word lede versoek om asb hulle naam, kontak foon-nommer (beide kantoor en selnommer) en korrekte email-adres te e-pos na Luther Siebert by
mls@iafrica .com Bogenoemde inligting sal verseker dat die verspreiding van inligting korrek plaasvind en die lede bereik. (Enige bykomende inligting bv ID-nommer, pos adres, huidige werkgewer, ens sal waardeer word.)

Lede wat reeds bogenoemde inligting deur gestuur het word bedank vir hulle samewerking.

(ii) Alle lede word vriendelik versoek om enige nuusgebeure, gebeurtenisse mbt die landbou en ander inligting deur te stuur na bogenoemde e-pos adres vir verdere verspreiding.

(iii) Om instaat te wees om 'n nuusbrief saam te stel wat die aktiviteite van SAILI se lede weergee, word n vriendelike versoek aan alle lede gerig om artikels in te stuur waarin die lid se huidige werks aktiviteite of belangstellings velde uitgebeeld word. Stuur asb sodanige artikels na bogenoemde e-pos adres.

REQUEST TO ALL MEMBERS:

(i) To be able to keep the member database up to date and correct – which will aid in the dissemination of information to members – each member is requested to please email their name, contact telephone number (office and cell) and correct e-mail address to Luther Siebert at mls@iafrica.com. (Any other information, e.g., ID number, postal address, present employer, etc will appreciated.)

To those who have already submitted the above a word of thanks.

(ii) All members are invited to send news items, agricultural activities in their regions and other relevant information to the e-mail address above.

(iii) To be able to produce a newsletter of interest to the members, a request is made to all members to please submit articles about their present field of work or interest of between 1000 – 1500 words for publication. Please send such articles to the above e-mail address.
