FEEDBACK TO RD&E COMMITTEES

2012
STAKEHOLDER ISSUES

South African Sugarcane Research Institute
Mount Edgecombe

UNLOCKING THE POTENTIAL OF SUGARCANE

Website: http://www.sugar.org.za

INTRODUCTION

The South African sugar industry's regional Research, Development and Extension (RD&E) Committees play a vital role in guiding an important component of SASRI's annual Programme of Work for research. In addition to the role played by Extension and ongoing direct communication between SASRI specialists and Stakeholders, it is through these committees that the institute ensures that the research programme remains responsive and relevant to stakeholder needs.

This document serves to provide feedback to regional RD&E Committees on the way in which the issues brought to the attention of SASRI in 2011 have been progressed. These are the issues submitted through Extension in late 2010 and early 2011 and which were the subject of intense discussion and prioritisation during the RD&E Committee Annual General Meeting held at Mount Edgecombe on 17 March 2011. Since that inaugural AGM, the issues have been subjected to several rounds of discussion by SASRI researchers, extension specialists and knowledge management experts, with a view to developing the SASRI Programme of Work for the 2012/2013 Season.

Contained within these pages are informative and helpful comments and opinions from SASRI specialists on the issues raised, as well as an indication on the way in which each has been addressed. This may be in the form of a new research or technology development project or an intended knowledge transfer activity to improve communication between SASRI and the communities it serves.

The information is presented in the form of a table and the content of each column is explained in Figure 1.

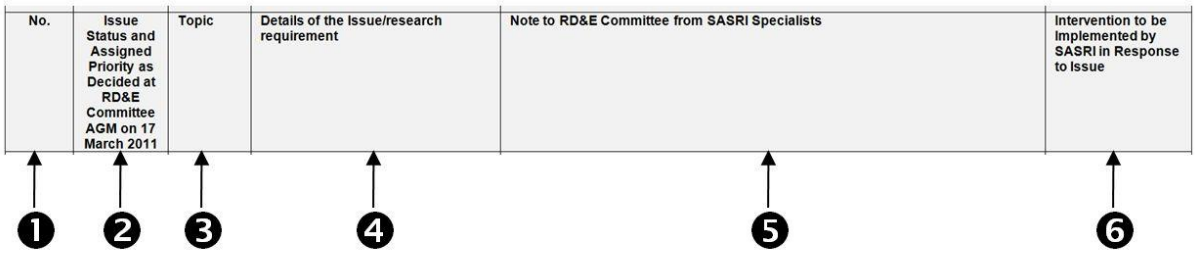

Figure 1. *Structure of Table Comprising Document*. Column headings refer as follows: ❶ - Number assigned to each issue upon receipt from RD&E Committees; ❷ - Indication of whether the issues were deemed as priority or non-priority after discussion by Stakeholders at the 2011 RD&E AGM; ❸ - Broad categorisation of each issue; ❹ - the issues submitted to SASRI by RD&E Committees in late 2010 and early 2011; ❺ - information on the issue provided by SASRI specialists; and ❻ the intervention that SASRI intends to pursue in response to the issue, which may be in the form of a research project, technology development project or knowledge transfer activity.

Clearly apparent from discussion of the issues raised by the RD&E Committees is that improved two-way communication between SASRI and industry stakeholders will be of enormous benefit. For example, many of the issues raised may be laid to rest through communication. SASRI believes that the revitalised RD&E structures, including the annual RD&E AGM will greatly assist in fulfilling this important goal. Also, it is hoped that this document will also prove useful to RD&E Committees and the constuencies they represent.

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Issues, Description Of Issues and Background	Rating	Communiqué to RD&E Committees from SASRI Specialists
COASTAL TUGELA NORTH: COMBINED PRIORITY REGIONAL ISSUES		
Issue 6 – Poor root development: Describe the issue: Poor root development. Background: Poor root development in hinterland/cooler areas resulting in yield decline. End result: Improved penetration and rooting for growers.	B	Poor root development is very widespread in the Industry and is cause for concern. The phenomenon appears not to be limited to soils with excessive subsoil acidity. Planning is underway for an initiative to catalogue the factors contributing to poor root development in various rainfed regions of the industry. Professor Malcolm from the University of Georgia participated in a workshop at SASRI in August 2012 and provided insights to similar poor root growth in North, Central and South America. The knowledge shared by Professor Sumner will guide the development of an appropriate initiative, in which SASRI Extension will play a key role. Growers are encouraged to share their experiences of crop rooting on their farms, stunted or otherwise, with their Extension Officer. Such information is essential if factors contributing to stunted root growth are to be documented.
Issue 3 – Thrips: Describe the issue: Major yield losses in ratoon's lack of control measures in ratoon cane. Background: Yield loss. New threat. End result: Control of Thrips without major environmental hazard. Quantify yield loss due to Thrips and varietal variability	A	Yield increases of 16-28% have measured in plant crops and 4-13% in the first ratoon crops have been measured after the use of Bandit. The chemical is registered for the control of thrips in ratoon cane and the timing, frequency and mode of application are reflected on the product label. For long-term, sustainable control of thrips, variety resistance is to be actively pursued in the SASRI Breeding Project (00VI01). Planning is underway to enable the monitoring of Thrips numbers simultaneously to the current Eldana resistance screening programme for varieties. This would then become a routine programme complementing other initiatives (e.g. agro-chemical and crop management research) towards the long term control of Thrips.
Issue 7 – Locusts: Describe the issue: Major yield losses. Background: Third year of major increase in locust infestation – 2 000 ha now. End result: Quantify crop loss. Develop applicable/appropriate control measures.	A	Two research projects have been initiated in response to the emerging locust problem in the industry. The first project aims at developing an approach to constrain the spread of the pest (11TD05: Investigation into options for the suppression of grasshopper infestations), while the second project seeks to understand the biology of the pest so that sustainable mechanisms for controlling the pest can be developed. This second project is being conducted in conjunction with scientists in the Department of Conservation Ecology and Entomology at Stellenbosch University. At this stage, assessing crop loss difficult but use of the SASRI crop model in this regard will be investigated.
Issue 1 – Silicon: Describe the issue: Silicon's effectiveness in reducing Eldana susceptibility. Increasing Eldana levels. Sub-soil acidity. Background: Many soils deficient in silicon. Eldana restricts crop cycle length. End result: Cost effectiveness of various sources of Silicon. Varietal variations of Silicon update.	A	The benefits of optimal Si nutrition on increasing Eldana resistance has been well established at SASRI, especially in susceptible varieties. The major question at the moment focuses on increasing sugarcane Si uptake from the soil. In August 2012, SASRI was fortunate to host Professor Malcolm Sumner from the University of Georgia. Professor Sumner is an internationally-recognised leader of soil chemistry in sugarcane cropping systems, with extensive experience in the Americas. The outcomes from these discussions on optimising Si uptake will be communicated to Growers in an article in The Link. A project (08CP02: Towards a crop nutritional IPM method to reduce the impact of pests and diseases on plant cane) is currently in progress looking at ways to improve silicon uptake from Calmasil and the effectiveness of several other sources in providing plant available silicon to sugarcane.

Issue 2 – Gypsum/Lime: Describe the issue. Movement of gypsum/lime when broadcast on minimum tillage fields. Background: Steep slopes not allowing incorporation. Tillage results in significant soil loss. End result: Eliminate sub-soil acidity under minimum till conditions. Speed of movement of gypsum and various forms of lime down profile.	B	Research is in progress on measures necessary to correct subsoil acidity, and the time taken for products such as gypsum to move into subsoils. On steep slopes tillage is not an option, and the following is the best procedure: • Soil acidity problems should be addressed at planting. This means that soil sampling should ideally be carried out after harvesting of the penultimate crop before re-establishment. • In order to optimise incorporation in the soil on steep slopes, lime and gypsum should be broadcast over the whole area immediately after the drawing of furrows (lime and gypsum applications must not be only in the furrow). • For ratoons on steep slopes, there is no alternative but to top-dress lime and gypsum. However, the likelihood of losses of these products in runoff underlines the importance of their correction during the planting operation.
Issue 8 – Cover crops: Describe the issue: Economic benefit/loss over a full crop cycle of planting a cover crop. i.e. does 10 year yield without cover crop vs. 9/10 year cover crop yield. Background: Cover crop leads to one less crop/10 years. End result: Economic assessment.	A	An economic assessment of green manuring on the coast was presented at the 2012 SASTA Congress (Rhodes R, Ferrer SRD and Gillit CG [2012] The economics of green manuring in the South African sugar industry. Proc S Afr Sug Technol Ass 85: 80-85). This paper is likely to be chosen for presentation at the post-congress SASTA Roadshow, should this event be scheduled for 2013. An article in The Link, summarising the results, will be prepared for the September edition. Results will also be presented at Grower Days throughout the industry when green manuring is chosen as a presentation topic. It is likely that this study will be expanded to include the other areas of the industry in future.

Issue 5 – Mechanisation: Describe the issue: Shortage of cutters. Background: Inability to harvest rateably. End result: Mechanical harvesting that is both economic and sustainable. Does not affect ratoons.	C	Labour availability is a cyclical issue. It appears that availability is affected by construction industry demand for labour. Pay day absenteeism seems to be an issue too that would cause DRDs to be affected. The outcomes of a study conducted by Carel Bezuidenhout's group at UKZN on this issue in the Eston area were recently published (Kadwa AM, Bezuidenhout CN and Ferrer SRD [2012] Cane supply benefits associated with the mitigation of labour absenteeism in the Eston sugarcane supply chain. *Proc S Afr Sug Technol Ass* 85: 47-49). More specifically, payday issues and mill stops were examined to assess whether the purchase of a chopper harvester was warranted for the Illovo Beaumont farm. Labour is relatively inexpensive and has the least impact (base cutting, cane and sugar losses, compaction, stool damage etc.). Strategically, the industry needs to progress towards controlled traffic (or minimising stool damage) if labour shortages are anticipated and no low impact mechanisation alternatives are available. Currently existing mechanical harvesters in the industry are underutilized. Fields are often not planned for mechanical harvesting in both layout and for infield mechanical harvesting and trafficking operations. Harvesting using chopper harvesters should be outsourced to contractors to increase machinery utilization if costs are to be reduced. Alternative harvesting methods include: • The "Thumper" is an option where skilled cutters are few or not available. • The "Vicro" harvester http://www.caneharvester.co.za/ • Contract harvesting (Might be an opportunity for self-employment or development of small businesses). • Small chopper harvester by CASE Austoft AHX1800 or 4000. Able to harvest narrow rows. Weight of 7-8t vs typical 12-15t harvesters. • Other harvesting equipment that was developed by SASRI (Plans are available for the "Edgecombe", "SASEX", "Midway" cane cutters and base cutter assembly drawings) • Harvesting equipment from other countries (i.e. India and China). An internet search is warranted to compile a list of available machinery. Examples include: www.globalwinwin.com ; http://shrijee.com/agri/sch.html ; http://www.tagrm.com/list.php?id=23&gclid=CJGx5fqhqrACFUYntAodMyyjVw ; http://www.agmachine.com/immd48i.htm ; http://www.agmachine.com/apcaem.htm • LIMA (LIMA is a NGO non-profit organisation that is involved with a lot of rural development initiatives). An option to be considered is the establishment of small business models for emerging contractors that wish to conduct contract harvesting for small-scale growers (potentially using the Thumper). http://www.lima.org.za/
Issue 9 – Fibre off-crop: Describe the issue: Fibre cover crop in fallow fields to be harvested in off-crop for co-gen. Background: Off-crop income. Break crop cycle. End result: Year-round income without reduced income over 10 years.	C	Unfortunately, although SASRI strongly acknowledges the importance of crop rotation and its benefits in terms of soil health, it is beyond SASRI's industry mandate to study the agronomics of crops other than sugarcane. Additionally, growing a fibre crop for the off-season would involve a significant industry decision and buy-in, as the mills are currently closed for maintenance during this period. Although study of these crops is currently beyond our mandate, Cedara/Department of Agriculture is a good source of information on alternative crops. Rob Osborne (Head of Horticulture) 033 3558140 or Vlatko Katusic (extension officer and an experienced vegetable grower) 031 3022848 can be contacted for advice on cash crops other than sugarcane. SASRI can be contacted for advice on correct fertiliser management for sugarcane grown after such crops.

AMATIKULU: COASTAL TUGELA NORTH REGION		
Crop husbandry: Poor root development in the hinterland of Eshowe and other similar hinterland areas, is one of the issues contributing to yield decline. This needs to be addressed on a multidisciplinary level as part of a formal research programme and not just an ERA.	B	Poor root development is very widespread in the Industry and is cause for concern. The phenomenon appears not to be limited to soils with excessive subsoil acidity. Planning is underway for an initiative to catalogue the factors contributing to poor root development in various rainfed regions of the industry. Professor Malcolm from the University of Georgia participated in a workshop at SASRI in August 2012 and provided insights to similar poor root growth in North, Central and South America. The knowledge shared by Professor Sumner will guide the development of an appropriate initiative, in which SASRI Extension will play a key role. Growers are encouraged to share their experiences of crop rooting on their farms, stunted or otherwise, with their Extension Officer. Such information is essential if factors contributing to stunted root growth are to be documented.
Varieties: The “Ratoonability” and “Long Term Sustainability” of new varieties is questionable and needs to be addressed.	B	The SASRI Extension Specialist operating in the Zululand region will organise a tour of SASRI plant breeding operations. Information will be conveyed regarding the way in which stool longevity is currently addressed in variety selection and evaluation. Recent analyses have confirmed that the overriding factors influencing ratooning ability is environment and management practices. A given variety will show very different ratoon yield decline patterns under different conditions. Within a particular set of conditions, varieties do show subtle differences in ratooning ability. SASRI varieties do differ in ratooning ability, however, it is false to generalize that the “new” varieties have poorer ratooning ability than the older varieties. Newer varieties such as N36 and N41 have been shown to ratoon just as well as older varieties like N25 and NCo376, respectively. The ratooning of varieties and the overriding effects of environment are demonstrated in a LINK article. A paper presented at SASTA 2012 covered these concepts in further detail (a copy of the paper is available on request: Ramburan S, Wettergreen T, Berry SD and Shongwe B [2012] Effects of variety, environment and management on sugarcane ratoon yield decline. *Proc S Afr Sug Technol Ass* 85: 180-192). Additionally, all post-release variety trials are being harvested over as many ratoons as possible, and the results of these long-term trials are routinely being communicated to growers at grower events. Furthermore, an ongoing SASRI research project (10VI03: Investigating variety ratooning dynamics) specifically aims to identify certain variety characteristics associated with good ratooning ability. These efforts are part of a multi-pronged approach to evaluate, improve and maintain good ratooning ability in the industry.

Biotech/Silicon: Increasing the harvesting cycles on the coast from 13 to 16 months would result in improved economic returns. Research to facilitate a lengthening of such cycles by countering the Eldana problem needs to be addressed. This could include the introduction of “Bt” cane into the industry or improved uptake of silicon into the plant.	A	Several issues are raised here: (a) improved uptake of silicon; (b) Bt cane for Eldana control; (c) increasing the cutting cycle to maximise yields. (a) Improved uptake of silicon: This research issue is already part of the SASRI Programme of Work as two projects, 07CP05 (Effects of water availability in determining silicon uptake by sugarcane and silicon-mediated resistance to Eldana) and 08CP02 (Towards a crop nutritional IPM method to reduce the impact of pests and diseases on plant cane). For 07CP02, results confirm that Calmasil is an efficient liming source (better than conventional dolomitic lime), which significantly increased plant Si levels. While water stress significantly increased Eldana damage and numbers, there was no effect of the Si (Calmasil) treatments in suppressing Eldana, probably due to high (>50 mg/kg) levels of endogenous soil Si in the first pot trial and low overall infestation levels in the second trial. [Sithole, Keeping, Smit, Miles, Mkhize and Sewpersad (2011) Effect of water availability on silicon uptake by sugarcane and silicon-mediated resistance to Eldana saccharina walker. *Proc S Afr Sug Technol Ass* 84: 193-197]. In 08CP02, significantly improved Si uptake has been observed with N supplied as ammonium as opposed to nitrate in two pot trials. In response to 2011 RD&E feedback, four pot trials will be conducted in 2012, looking at the effect of various sources of organic matter (e.g. compost, chicken litter, humate and biochar), phosphate and gypsum on Si uptake from Calmasil, as well as uptake from other sources of Si, e.g. potassium silicate (slow-release formulations from different suppliers), thermophosphate, other calcium silicates, diatomaceous earth, and a foliar-applied silicic acid product. Project 08CP02 will finish at the end of 2013, after which field trials may be conducted, concentrating on those products or amendments that give the most promising results in the pot trials. Si as an Integrated Pest Management measure would be aimed at areas (coastal and Midlands) with highly weathered soils, low in Si, with high acidity, and usually poor moisture retention where there is likely to be water stress. (b) Bt cane for Eldana control; This approach is difficult due to the high costs of licensing fees from multinational companies and the relatively small size of the SA industry. A SASTA paper in 2012 (Snyman SJ and Meyer GM [2012] Improvement of sugarcane in South Africa using genetic engineering: Requirements for potential commercialisation. *Proc S Afr Sug Technol Ass* 85: 96-101) summarised industry decisions that need to be made in order to pursue a commercial GM approach. However, it must be emphasised that Bt cane would be part of an IPM approach for the control of Eldana. (c) Increasing the cutting cycle to maximise yields: Increasing the harvest age from 12 to 18 months and concomitant yield increase is highly dependent on variety, management practice, environmental conditions and Eldana damage [Ramburan, Sewpersad and McElligott (2009) Effects of variety, harvest age and Eldana on coastal sugarcane production in SA. *Proc S Afr Sug Technol Ass* 82:580-588.]. The above SASTA paper showed that higher yields can be achieved on an 18 month cycle only if Eldana is controlled.

Trips: Despite the use of Bandit, Trips control is still inadequate and needs to be addressed further, particularly in ratoon cane.	A	Yield increases of 16-28% have measured in plant crops and 4-13% in the first ratoon crops have been measured after the use of Bandit. The chemical is registered for the control of Thrips in ratoon cane and the timing, frequency and mode of application are reflected on the product label. For long-term, sustainable control of Thrips, variety resistance is to be actively pursued in the SASRI Breeding Project (00VI01). Planning is underway to enable the monitoring of Trips numbers simultaneously to the current Eldana resistance screening programme for varieties. This would then become a routine programme complementing other initiatives (e.g. agro-chemical and crop management research) towards the long term control of Trips.
Fertility: Quantify the movement of both Lime and Gypsum down the soil profile when this is broadcast after ridging, under a minimum till operation on steep slopes. This requirement has become necessary following extremely severe rainfall events that have resulted in massive erosion on steep slopes, which had been fully cultivated due to the need to incorporate lime.	B	Research is in progress on measures necessary to correct subsoil acidity, and the time taken for products such as gypsum to move into subsoils. On steep slopes tillage is not an option, and the following is the best procedure: • Soil acidity problems should be addressed at planting. This means that soil sampling should ideally be carried out after harvesting of the penultimate crop before re-establishment. • In order to optimise incorporation in the soil on steep slopes, lime and gypsum should be broadcast over the whole area immediately after the drawing of furrows (lime and gypsum applications must not be only in the furrow). • For ratoons on steep slopes, there is no alternative but to topdress lime and gypsum. However, the likelihood of losses of these products in runoff underlines the importance of their correction during the planting operation.

Mechanisation: Research into the reasons why we have such a labour shortage, particularly cutters, when SA has such a large unemployment problem and what we as growers or the industry are able to do about it. The corollary to this is the need to devise cheap and efficient mechanical harvesters.	B	Labour availability is a cyclical issue. It seems this is affected by the construction industry demand for labour. Pay day absenteeism seems to be an issue too that would cause DRD deliveries to be affected! CNB student (M Khadwa) has conducted ag eco's costing on this for the Eston area. More specifically payday issues and mill stops to see if a chopper harvester were warranted for the Illovo Beaumont farm. Labour is relatively inexpensive and the least impact (base cutting, cane and sugar losses, compaction, stool damage etc.). Strategically, the industry needs to progress towards control traffic (or minimising stool damage) if labour shortages are anticipated and no low impact mechanisation alternatives are available. Currently existing mechanical harvesters in the industry are underutilized! Fields often not planned for mechanical harvesting in both layout and for infield mechanical harvesting and trafficking operations. Harvesting using chopper harvesters should be outsourced to contractors to increase machinery utilization if costs are to be reduced. Alternative harvesting methods include: • The "Thumper" is an option where skilled cutters are few or not available. • The "Vicro" harvester http://www.caneharvester.co.za/ • Contract harvesting (Might be an opportunity for self-employment or development of small businesses). • Small chopper harvester by CASE Austoft AHX1800 or 4000. Able to harvest narrow rows. Weight of 7-8t vs typical 12-15t harvesters. • Other harvesting equipment that was developed by SASRI (Plans are available for the "Edgecombe", "SASEX", "Midway" cane cutters and base cutter assembly drawings) • Harvesting equipment from other countries (i.e. India and China). An internet search is warranted to compile a list of available machinery. Examples include: www.globalwinwin.com ; http://shrijee.com/agri/sch.html ; http://www.tagrm.com/list.php?id=23&gclid=CJGx5fqhqrACFUYntAodMyyjVw ; http://www.agmachine.com/immd48i.htm ; http://www.agmachine.com/apcaem.htm • LIMA (LIMA is a NGO non-profit organisation that is involved with a lot of rural development initiatives): Peter Lyne mentioned of him speaking to LIMA (based in PMB) for setting up small business models for emerging small scale contractors that wish to conduct contract harvesting (using the Thumper?). http://www.lima.org.za/
COASTAL TUGELA NORTH: FELIXTON REGION		
The effect of silicon on pests like Eldana: What are the benefits of increasing the silicon content of soils? Is silicon effective when it comes to Eldana control?	C	The benefits of optimal Si nutrition on increasing Eldana resistance has been well established at SASRI, especially in susceptible varieties. The major question at the moment focuses on increasing sugarcane Si uptake from the soil. In August 2012, SASRI was fortunate to host Professor Malcolm Sumner from the University of Georgia. Professor Sumner is an internationally-recognised leader of soil chemistry in sugarcane cropping systems, with extensive experience in the Americas. The outcomes from these discussions on optimising Si uptake will be communicated to Growers in an article in The Link. A project (08CP02: Towards a crop nutritional IPM method to reduce the impact of pests and diseases on plant cane) is currently in progress looking at ways to improve silicon uptake from Calmasil and the effectiveness of several other sources in providing plant available silicon to sugarcane.

What is the best commercial source of silicon? The amount of silicon in local sources like fly – ash is limited. If silicon is needed in quantities, where is it best sourced from?	C	In August 2012, SASRI was fortunate to host Professor Malcolm Sumner from the University of Georgia. Professor Sumner is an internationally-recognised leader of soil chemistry in sugarcane cropping systems, with extensive experience in the Americas. The outcomes from these discussions on optimising Si uptake will be communicated to Growers in an article in The Link. A project (08CP02: Towards a crop nutritional IPM method to reduce the impact of pests and diseases on plant cane) is currently in progress looking at ways to improve silicon uptake from Calmasil and the effectiveness of several other sources in providing plant available silicon to sugarcane.
Replanting cane on rehabilitated soils after mining: Often areas need to be rehabilitated before sugarcane can be planted. Rehabilitation may be necessary due to erosion or mining. In the Felixton area, the area mined by Exxaro has been reconstituted. The area now needs to be rehabilitated and cane needs to be replanted. Even green manure crops are struggling to grow.	B	**COMMENT REQUIRED**

Issues, Description Of Issues and Background	Rating	Communiqué to RD&E Committees from SASRI Specialists
COASTAL TUGELA SOUTH: COMBINED PRIORITY REGIONAL ISSUES		
Issue 12 – GM Cane: Describe the issue: GM drought resistant cane. Background: Climate change. Regular drought events. Desired end result: Cane with cactus genes	C	Drought stress responses in sugarcane (and in all plants) are complex and the SASRI R&D Programme is currently addressing the issue through four research projects. (a) Conventional breeding In the Breeding Project (00VI01), selection of varieties for release to the rainfed regions of the industry is performed under dryland conditions. Hence, these varieties are adapted to prevailing rainfall patterns, which are sometimes sub-optimal for sugarcane. As a result, South African dryland varieties are generally regarded as being robust in tolerating water deficit stress. (b) Variety water stress index Assessment of yield response of commercial varieties to water stress is currently under investigation in Project 08VI03. Extensive historical data on variety responses to prevailing rainfall are being used in concert with the CaneSim crop model to develop an objective water stress index for varieties. Subject to further validation, these findings will be included on variety information sheets to further assist growers with variety choice. (c) GM approach A GM approach is the basis for a project initiated in 2010 (09VI04). The dehydration-responsive element binding proteins (DREBs) are a class of transcription factors that control the expression of many stress-inducible genes. They have been isolated from many crops and these genes have conferred tolerance to abiotic stress, namely drought, high salt and cold stress, on the host crop when inserted into its genome. Expression of the transcription factors may affect plant yield negatively but using a stress-inducible promoter appears to overcome this limitation. However this project is R&D only and will not lead to commercial GM sugarcane. (d) Physiology of drought tolerance The physiology of drought tolerance of conventional sugarcane and energy cane varieties are studied in a rainshelter trial at Mount Edgecombe and field trials in Komatipoort (08RE14). Understanding the mechanisms of drought tolerance better will help us to define breeding targets and best management practices for current and future environments.
Issue 4 – Eldana Control: Describe the issue: On-going problem of Eldana. Background: Eldana has been around for 20 years, still out of control. End result: Technology transfer (Field day, LINK article, IPM manual)	C	An IPM manual for Eldana control is in development (SASRI Project 11KT04: IPM Manual for Eldana) under the leadership of Dr Stuart Rutherford. Innovative Integrated Pest Management approaches, including habitat management ("push-pull"), are to be steadily rolled out through Extension and Pest and Disease structures, including Grower Days, articles in The Link and the IPM Manual, once completed.

Issue 1 – Eldana young cane: Describe the issue: Application of pesticides on young cane and at moth peak (April, Sept). Background: Numerous fields of young cane infested with Eldana (3-4 months). Desired End Result: Effectiveness of recommendations and feasibility.	A	Such a severe impact on young cane is typically due to high numbers in the previous crop with below ground infestation of stools. This was most likely a consequence of 2010 drought. Treating the crop at the time of the April-May moth peak or the August-November moth peak in affected young cane may well reduce subsequent Eldana infestation levels. Early season application of Fastac is currently being examined in a SASRI project (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control).
Issue 10 – Polymer Crystals: Describe the issue: Benefits of applying Polymer crystals at planting. Background: Used in timber industry and have added fertilizer/chemicals with it. Desired End Result: Cost effective planting?	C	• The cost of polymer crystals is high, and their use is not economical for sugarcane. • There is no longer wide use of polymers in forestry due to the high costs involved. • Improved moisture use and retention in soils should be addressed through other means; e.g. trashing, incorporation of organic matter and the correction of subsoil acidity problems (so as to improve rooting).
Issue 2 – Eldana and ripening: Describe the issue: Impact of chemical ripeners on Eldana. Background: SASRI recommends not to ripen cane infected with Eldana. Desired End Result: Application Threshold levels (SLR, E/100).	A	Crop management practices that could potentially aggravate pest or disease pressure in a field are not recommended by SASRI. For example, SASRI would never recommend increasing N-application rates in fields where Eldana is a problem. The same holds true for ripeners. Chemical ripeners slow down sugarcane growth, increase cane quality and cause emission of stress signals (ethylene) by the plant, all factors known to attract Eldana. Even in irrigated 12-month crops, Eldana numbers are drastically increased if ripened fields are carried over. Best recommendation: If Eldana pressure is such that it will impact on RV yields, do not apply ripeners.
Issue 11 – CMS/Trips: Describe the issue: Is there a correlation between CMS and the incidents of Thrips. Background: Perception of higher Thrips when applying CMS. Desired end result: Quantified through trial results (in progress)	C	The effect of CMS on Thrips infestation is unknown and the scope of a current project (07RE01: Long-term effects of CMS on soil quality) will be extended to accommodate Thrips observations in the two field trials near Eston.
Issue 9 – Seedcane/ pretrashing: Describe the issue: Is there a benefit of pretrashing seedcane? Background: A number of growers have observed better germination /tillering from pre trashed seedcane. Desired End Result: Technology transfer.	C	Results from project 06RE02 (De-trashing: Optimal method and timing) showed that de-trashing cane before harvest is more costly compared to trash removal during harvesting. The results came from two trials (N17 and N27) and both had the same result. SASRI did not confirm the results from the small plot trials with that from large commercial fields and it is doubtful that the end result would have been different. The project also evaluated germination of two varieties, each with and without a trash blanket and there was no germination advantage to de-trashed cane.
Issue 7 – Micro Nutrients: Describe the issue: Importance and understanding of micro nutrients. Background: A number of growers are starting to apply micro nutrients without understanding the benefits and costs. Desired End Result: MN recommendations which include economics	B	All micronutrients are important to the sugarcane plant. Indications are that certain micronutrients may be limiting growth in many areas. Leaf sampling is important to identify those micronutrients that are limiting in a particular crop. A SASRI Information Sheet on the micronutrient requirements of sugarcane will be prepared.

Issue 6 – Mechanical planting: Describe the issue: Currently growers are doing their own R&D on mechanical planting. Background: Increased labour costs – availability of labour. Desired end result: Recommendations and specs on mech planting.	B	A SASRI project (09SD01: Mechanical minimum tillage sugarcane planter: performance and operation) investigated the performance and operation of a minimum tillage planter and raised these issues and discussed the range of variables and sensitivities. The project report has been distributed and is available through the local Extension Specialist. Planning is underway to communicate the outcomes of the study to Growers, which may include an article in The Link. Field test reports on a Walletz mechanical planter operating under full tillage conditions are available in the SASRI Library, which can be accessed by local extension.
Issue 5 – Bio fuel: Describe the issue: Alternatives to diesel to run farm operations. Background: Diesel prices on the increase – growers looking for alternatives. Desired end result: Research outcomes identifying energy sources from sugarcane (co-gen and Ethanol).	C	**COMMENT REQUIRED**
Issue 8 – Seedcane: Describe the issue: Various options of seedcane. Background: Growers are establishing 1st stage nurseries using speedlings, Novacane® and HWT. Desired End Result: Which is the most viable option for seedcane?	A	Row spacing information for transplants was obtained from D McElligott. He recommends a 1 m row with plant spacing of 500 mm (i.e. 20,000 plants/ha). This is what is recommended for NovaCane® in the SASRI NovaCane® planting guide. However, Sezela Transplant nursery seems to be in the process of changing this to 400 mm as this improves canopy development and increases plant population. From direct experience in Midlands with NovaCane®, the following observations were made: (a) At the Eston centralised nursery (Tala Valley – G Gurney's farm with supplementary irrigation) NovaCane® plants were planted at 1,25 m row width and 600 mm plant spacing as is the practise for this farm. After 6 months (spring plant), an average of 30 tillers per stool was observed. (b) Midlands North seedcane scheme has used the standard 1 m row width and 500 mm plant spacing for establishing NovaCane®.
Issue 3 – Compatibility of ripener and pesticides: Describe the issue: Can you mix it or not? Background: Saving application costs by applying both chemicals at once i.e. ripener and controlling Eldana. Desired End Result; Recommendations and effectiveness.	C	Ripeners and Fastac cannot be mixed as neither is registered as a mixture. Best recommendation: First remove Eldana problem from field before considering chemical ripening.
Issue 13 – Mechanisation: Describe the issue: Mechanisation reports required earlier in the year for budgets. Not covering OHS costings. Background: Currently reports coming out end April. End result: Reports ready by 28 February which include OHS requirements	B	Manufacturers typically update their prices early in the new year (i.e. January/February). The parliamentary budget speech in March guides the fuel rebate and CPI linked wage increases. The labour wage cost surveys from Canegrowers is usually concluded in April. Suggestions: • In order to breach the period between when this information is required and when it is available growers should apply an escalation to costs from the previous year. • Alternatively a set of preliminary graphs can be rerun at any time of the year to accommodate changes only to items such as fuel and interest rate while other inputs are left unchanged.

DARNALL, GLEDHOW AND MAIDSTONE: COASTAL TUGELA SOUTH REGION		
Eldana – annual increase. Trend is higher after each year. What can be done to decrease the overall population of Eldana across the season? This year (2011) numerous fields of young cane, 3-4 months old was badly infected in the Shakaskraal area and further north towards Darnall. Effect of early season Fastac application and cost implications.	A	A severe impact on young cane is typically due to high numbers in the previous crop with below ground infestation of stools. This was most likely a consequence of 2010 drought. Treating the crop at the time of the April-May moth peak or the August-November moth peak in affected young cane may well reduce subsequent Eldana infestation levels. Early season application of Fastac is currently being examined in a SASRI project (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control).
Bio-fuel: Is there a way forward with ever increasing fuel prices? What is the alternative for Agric vehicles as a fuel source for the future? Bio-diesel and the availability/production.	A	
SEZELA: COASTAL TUGELA SOUTH REGION		
Genetically Modified Sugarcane: Is any research being done on GM sugarcane to assist with drought resistance and a more productive crop (high tonnages)?	A	A GM approach for increasing drought tolerance is the basis for a project that was initiated in 2010 (09VI04). The dehydration-responsive element binding proteins (DREBs) are a class of transcription factors that control the expression of many stress-inducible genes. They have been isolated from many crops and these genes have conferred tolerance to abiotic stress, namely drought, high salt and cold stress, on the host crop when inserted into its genome. Expression of the transcription factors may affect plant yield negatively but using a stress-inducible promoter appears to overcome this limitation. However this project is R&D only and will not lead to commercial GM sugarcane. It has been estimated that increasing sucrose content of sugarcane is 1.8 time more valuable that increasing biomass yield. This is primarily associated with the reduced costs associated with the transport and milling of high sucrose content stalks. Since 1998, SASRI has conducted collaborative research with the Institute of Plant Biotechnology at Stellenbosch University to increase the sucrose content of sugarcane by genetic engineering. The partnership has yielded several patents and promising high-sucrose lines are currently under field trial evaluation at Mount Edgecombe.
Pesticides on young cane for Eldana: Eldana has been found in very young cane i.e. less than 40cm of stick. Is there any advantage in spraying pesticides to control Eldana on young cane?	A	A severe impact on young cane is typically due to high numbers in the previous crop with below ground infestation of stools. This was most likely a consequence of 2010 drought. Treating the crop at the time of the April-May moth peak or the August-November moth peak in affected young cane may well reduce subsequent Eldana infestation levels. Early season application of Fastac is currently being examined in a SASRI project (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control).

Polymer Crystals: These Polymer crystals retain water up to 300 times its size. They absorb water and fertilizer and act as mini reservoirs for the roots in dry conditions. They may also absorb chemicals for possible pest control.	B	• The cost of polymer crystals is high, and their use is not economical for sugarcane. • There is no longer wide use of polymers in forestry due to the high costs involved. • Improved moisture use and retention in soils should be addressed through other means; e.g. trashing, incorporation of organic matter and the correction of subsoil acidity problems (so as to improve rooting).
Eldana Infestation & chemical ripening: SASRI recommends not to ripen cane that is infested with Eldana. What is the impact of Eldana infestation after applying chemical ripeners? What should the Eldana thresholds be where ripeners are not recommended?	B	Crop management practices that could potentially aggravate pest or disease pressure in a field are not recommended by SASRI. For example, SASRI would never recommend increasing N-application rates in fields where Eldana is a problem. The same holds true for ripeners. Chemical ripeners slow down sugarcane growth, increase cane quality and cause emission of stress signals (ethylene) by the plant, all factors known to attract Eldana. Even in irrigated 12-month crops, Eldana numbers are drastically increased if ripened fields are carried over. Best recommendation: If Eldana pressure is such that it will impact on RV yields, do not apply ripeners.
Micro Nutrients: A number of growers are applying various products which have micro nutrients. The request is for SASRI to investigate which nutrients are important and is it worth applying the products on the market?	B	All micronutrients are important to the sugarcane plant. Indications are that certain micronutrients may be limiting growth in many areas. Leaf sampling is important to identify those micronutrients that are limiting in a particular crop. A SASRI Information Sheet on the micronutrient requirements of sugarcane will be prepared.
Mechanical Cane Planter: Currently growers are doing their own R&D on sugarcane planters. Could SASRI assist in providing advice and specifications regarding a planter that is suitable to our industry?	B	A SASRI project (09SD01: Mechanical minimum tillage sugarcane planter: performance and operation) investigated the performance and operation of a minimum tillage planter and raised these issues and discussed the range of variables and sensitivities. The project report has been distributed and is available through the local Extension Specialist. Planning is underway to communicate the outcomes of the study to Growers, which may include an article in The Link. Field test reports on a Walletz mechanical planter operating under full tillage conditions are available in the SASRI Library, which can be accessed by local extension.
Viable Seedcane Production: What is the most viable option of producing 1st stage seedcane on the farm i.e. speedlings, NovaCane®, HWT?	B	Row spacing information for transplants was obtained from D McElligott. He recommends a 1 m row with plant spacing of 500 mm (i.e. 20,000 plants/ha). This is what is recommended for NovaCane® in the SASRI NovaCane® planting guide. However, Sezela Transplant nursery seems to be in the process of changing this to 400 mm as this improves canopy development and increases plant population. From direct experience in Midlands with NovaCane®, the following observations were made: (a) At the Eston centralised nursery (Tala Valley – G Gurney's farm with supplementary irrigation) NovaCane® plants were planted at 1,25 m row width and 600 mm plant spacing as is the practise for this farm. After 6 months (spring plant), an average of 30 tillers per stool was observed. (b) Midlands North seedcane scheme has used the standard 1 m row width and 500 mm plant spacing for establishing NovaCane®.
FASTAC & Eldana: Has SASRI researched the application of pesticides on the moth peak periods i.e. April and September?	A	Treating the spring moth peak is already a registered practice. Treating the crop at the time of the autumn moth peak may well reduce an Eldana infestation and may reduce the need for a summer treatment. It will also be easier to treat for the winter peak. This approach could be included in new long term project on pesticides.

UMZIMKULU: COASTAL TUGELA SOUTH REGION		
Eldana: The on-going problem of Eldana control.	A	Combating Eldana remains a priority research area at SASRI, focusing strongly on the selection of Eldana resistant varieties. Complementary research at the institute is aimed at developing an integrated approach to minimising the negative effects of this pest, which includes crop nutrition, crop husbandry, judicious pesticide application strategies and habitat management. SASRI is also at an advanced stage of assessing the potential of Sterile Insect Technology in managing Eldana numbers (this is the approach that has been so successful in managing coddling moth in the citrus industry). It is note that there are currently ten research projects addressing aspects of Eldana IPM. In addition, an IPM manual for Eldana control is in development (SASRI Project 11KT04: IPM Manual for Eldana) under the leadership of Dr Stuart Rutherford. Innovative Integrated Pest Management approaches, including habitat management ("push-pull"), are to be steadily rolled out through Extension and Pest and Disease structures, including Grower Days, articles in The Link and the IPM Manual, once completed.
Seedcane: Are there advantages of pre-trashing seedcane before planting?	C	Results from project 06RE02 (De-trashing: Optimal method and timing) showed that de-trashing cane before harvest is more costly compared to trash removal during harvesting. The results came from two trials (N17 and N27) and both had the same result. SASRI did not confirm the results from the small plot trials with that from large commercial fields and it is doubtful that the end result would have been different. The project also evaluated germination of two varieties, each with and without a trash blanket and there was no germination advantage to de-trashed cane.
Micronutrients: Do we fully understand the requirements and benefits of micronutrients in sugarcane?	C	All micronutrients are important to the sugarcane plant. Indications are that certain micronutrients may be limiting growth in many areas. Leaf sampling is important to identify those micronutrients that are limiting in a particular crop. A SASRI Information Sheet on the micronutrient requirements of sugarcane will be prepared.
CMS / Thrips: Is there a correlation between using CMS fertilizer and the incidence of Thrips?	C	The effect of CMS on Thrips infestation is unknown and the scope of a current project (07RE01: Long-term effects of CMS on soil quality) will be extended to accommodate Thrips observations in the two field trials near Eston.

Issues, Description Of Issues and Background	Rating	Communiqué to RD&E Committees from SASRI Specialists
IRRIGATED NORTH: COMBINED REGIONAL PRIORITY ISSUES		
Issue 4 – Leaf nutrient thresholds for "All" varieties (excluding N14/NCo376): Describe the issue: No available leaf nutrient thresholds for varieties other than N14 and NCo376. Background: Clearly differences – Need to know thresholds to assess nutrient uptake efficiency. End result: Leaf nutrient thresholds for all current varieties.	A	The development of reliable leaf nutrient thresholds, particularly for N, is a high-priority in SASRI's research programme. Current initiatives in this regard include: 1. Project 09CM02 investigates the responses of varieties to N in dryland and irrigated areas. It is envisaged that this project will contribute significantly to the refinement of leaf N thresholds for important varieties. 2. Project 08RE05, which examines responses to N, K and Si under dryland conditions, will contribute to the development of more robust thresholds for these nutrients. 3. Project 09CM01, involves numerous N response trials in dryland areas. This project has the objective of developing a more reliable soil test for N (to replace the 'N category' approach); however, the derivation of leaf N thresholds will form a part of this study. Although varietal differences in N thresholds may be significant, the variation in leaf N threshold with crop age (biomass) is thought to be of far greater importance. With this in mind, a proposal for a research project is under development. The project is entitled "Development of reliable leaf nitrogen threshold values" and the study will focus on investigating the relationships between biomass and N thresholds. In terms of variety-specific thresholds for nutrients such as P and K, it should be borne in mind that detailed and costly field trial programmes are necessary for the determination of such thresholds. With N being the major driver in ratoon growth, SASRI will focus available research capacity on this nutrient in the interim.
Issue 7 – Plant available P: Describe the issue: How much of the measured P is available to the plant? How do truoug and ambic tests relate/compare to each other? Accuracy of P tests. Background: New FAS test procedures and recommendations have created general uncertainty around P. End result: Plant available P together with fertiliser recommendations	A	Two issues are to be considered: (a) A suitable P test is required for Northern Irrigated area (NIA) soils. The Ambic P test has been found to extract extremely low amounts of P on many irrigated soils, while the Truog test, being acidic, is highly unreliable on these soils. FAS is currently implementing the Resin test for NIA soils; this will be a very positive development for production in these areas. (b) It appears that field experimentation to establish P test thresholds has never been conducted in the NIAs. There is an urgent need for research of this kind to be undertaken, not only in the NIAs, but in the rainfed areas of the industry as well. The objective of the research to be conducted in 12CM02 is to refine the calibration of the resin-based P-test using data obtained from a trial sited on virgin land in the Komatipoort area.

Issue 1 – Variety bulk density for payload estimation. Describe the issue: Estimate of bulk density by variety. Background: Over/under loading constraints and expense of loadcells/weighing equipment – need simple, inexpensive estimate of payload. End result: Simple, I inexpensive payload estimate methodology	B	The request is for an estimate of the bulk density of cane varieties to assist with achieving maximum legal payloads during transport. However, bulk density is only one of the factors contributing to low payloads and having the bulk density value is unlikely to help. Other factors include, lodged cane, vehicle and loader design, poor harvesting and loading practices. The issue is also an industry one and not limited to the irrigated North. This was recognised around 5 years ago and the KZN mills have been working at remedying the problem with an industry load control programme, but, the other mills decided not to participate in the process. Hence, they are way behind in understanding the issue. The irrigated North has now realised that there is impending legislation with severe penalties for overloading and in trying to reduce their overloading they have increased their under loading. Five years ago it was recognised that 30% of sugarcane vehicles were overloaded, this resulted in unsafe vehicles, increased wear and tear and severe damage to the roads. In spite of this, the average vehicle was under loaded and 1 out of every 7 trips to the mill was unnecessary, resulting in a significant increase in transport costs. This showed the massive variation in loading accuracy, from severe overloading to severe under loading, a large standard of deviation of loading, mostly due to poor harvesting and loading practices. Initiatives during this time have led to a far more precise loading of the vehicles There was also a request for a simple inexpensive system to measure loads on vehicles, many people have tried to develop such systems and failed. However, many growers have succeeded in loading their vehicles very precisely without such systems and SASRI has produced a DVD in Zulu which shows very effectively, how to load a vehicle correctly. Feedback from growers is that this has been very helpful. There was also a comment that commercial weighing systems were prohibitively expensive, this is simply not true. Yes, they are expensive, but, tracking the performance of these systems over the last 6 years has shown that the payback period even in well managed operations has been less than 18 months and the systems are still in operation. In poorly managed systems the payback time will be even shorter. Conclusion • Harvesting and loading must be well managed, the SASRI DVD shows very effectively how this can be achieved. • Commercial weighing systems should be used, they are cost effective and make managing the payload a lot easier. • The rigid and drawbar vehicle, the most commonly used by the TSB mills does have a slightly lower volume than the common interlink vehicle used in KZN, this does aggravate their issue slightly and they have to be more careful with loading. However, they also generally use the heavier slewing type loaders which enable them to compact the vehicles more effectively than the non-slew type common in KZN
Issue 3 – Tissue culture protocol Novacane®: Describe the issue: Recommendations & Refinement of BMP for vegetative propagation using Novacane®. Background: See issue 10 – 2011 RD& E. Of specific concern = optimum intra and inter-row spacing in nursery and commercial situations. End result: BMP manual for Novacane®	A	Row spacing information for transplants was obtained from D McElligott. He recommends a 1 m row with plant spacing of 500 mm (i.e. 20,000 plants/ha). This is what is recommended for NovaCane® in the SASRI NovaCane® planting guide. However, Sezela Transplant nursery seems to be in the process of changing this to 400 mm as this improves canopy development and increases plant population. From direct experience in Midlands with NovaCane®, the following observations were made: (a) At the Eston centralised nursery (Tala Valley – G Gurney's farm with supplementary irrigation) NovaCane® plants were planted at 1,25 m row width and 600 mm plant spacing as is the practise for this farm. After 6 months (spring plant), an average of 30 tillers per stool was observed. (b) Midlands North seedcane scheme has used the standard 1 m row width and 500 mm plant spacing for establishing NovaCane®.

Issue 5 – Weed control: Describe the issue: Control of creeping grasses Watergrasses, Rotboellia, Cyperus natalensis. Background: Herbicide guide recommendations not providing effective control. Mpumalanga have a revised control strategy which they would like tested. End result: Effective control of above weeds in sugarcane.	A	Dr Peta Campbell, the SASRI Weed Scientist, will liaise with Dr Pieter Cronje from TSB regarding specific and local weed problems.
Issue 9 – Flowering and pithing: Describe the issue: Need BMP recommendations for flowering and pithing using research on SA varieties used in Malawi, Zambia and Mozambique. Background: Significant problem in Mpumalanga, Swaziland and to a lesser extent Pongola and Umfolozi. Variety dependant. End result: BMP manual for variety and climate	B	A Knowledge Transfer Project (12KT04: Flowering and Pithing) will commence in 2013 under the Leadership of Dr Alana Eksteen, the SASRI Plant Physiologist. Dr Eksteen will survey the world literature and liaise strongly with Extension to prepare a dossier on flowering and pithing. Initiatives put in place in 2012 will continue, particularly with regard to the e-mail communication sent to all Extension Specialists (ESs) including Mpumalanga & UCL on 2 April 2012.. ESs will continue to monitor the incidence of flowering and/or pithing during the season. This monitoring requirement will be included in the ESs Programmes of Work under section 2 (Issue Extension). The objective of this monitoring is to assess the incidences of flowering and pithing, whether flowering and pithing occur simultaneously, how much of the stalk is affected by pithing and what were the climatic conditions prior to the advent of flowering and pithing. Flowering and pithing seems to be more prevalent in the northern irrigated areas so attention to this monitoring in these areas is important. An E-mail was sent to Pieter Cronje on 22 May 2012 requesting a breakdown of varieties that are affected by pithing.
Issue 8 – Generic/alternative ripener: Describe the issue: Generic ripeners need testing possible alternative hormonal ripener that has lesser effect on other crops. Background: End result: Alternative hormonal and herbicidal ripener and proper use of generics/alternatives	B	Commercial strip trial work to evaluate and compare Fusilade Forte and the generic, Volley, is currently being conducted in collaboration with Tsb Ltd. The results will be available in the second half 2012. An alternative hormonal ripener, Moddus, is in the process of being tested. It is likely that this product will have a lesser impact on other crops than Ethephon (Ethrel). No other promising non-hormonal chemistries currently available as potential ripeners.

Issue 2 – Land use planning service. Describe the issue: SUSFARMS – Nothing further written down.	C	SASRI does not currently offer a Land Use Planning service or a Soil Survey service to the Industry. The current strategy is that where possible, two Durban-based Extension Specialists (ESs) will provide support to regionally-based Extension Specialists in the drafting of Land-Use Plans. (LUPs) In requesting assistance, Extension Specialists are requested to use the SASRI Extension Request for Advice (ERA) system. Two SASRI Interns have been trained in the drafting of LUPs in order to provide further support to Extension. They have developed a system of drafting LUPs on PCs using free software, which is compatible to ArcView. The Interns will visit each extension area in KZN and do the following: • Ensure each extension office has the relevant base data of digital aerial photography and digital contour lines on their external hard drive. • Load the new free software onto the ESs laptop. • Train the ES on how to use the software to view the data. • Train the ES on how to draft a land use plan using the new software. They will be contacting each ES shortly to set a date. The ES will be expected to draft LUPs for their own growers. However, should the demand for LUPs exceed the ESs capacity, the ES can send in an ERA for assistance in drafting LUPs. SASRI does not offer soil surveys as a service. However, each ES is expected to be skilled in identifying soils and should be in the position to decide on the size of survey he/she can handle.
Issue 10 – Economics of crop cycle length: Describe the issue: Optimum crop cycle taking into account crop growth, P&D, lodging etc. Background: Natural maturity development varies according to variety and climate. Limiting factors include P&D, lodging, land costs, irrigation/water availability. End result: Crop cycle recommendations by a variety for Mpumalanga, Pongola and Umfolozi.	C	Variety trial data suggest that cane harvested at approximately 15 months of age in the irrigated North can produce up to 2 tons RV/ha benefit relative to 12 month old cane. The implications of increasing the harvest age on lodging and Eldana were not considered in these trials. More trials have to be analysed and if there are promising results without associated losses, then the concept may be taken further, and an article in The Link may be produced. This may then justify more research into the appropriate harvest age of varieties in the irrigated North.
MALELANE AND KOMATI: IRRIGATED NORTH REGION		
P&D: Quantify the loss due to major diseases in Mpumalanga- Smut, Mosaic, RSD. Year requested – 2010. Difficulty to get co-operator willing to allow high infection levels on-farm for experiment.	B	A project (11TD03: Effects of major diseases on yield under irrigated conditions) entered the SASRI 2012/2013 Programme of Work, although implementation was delayed due to difficulties in securing a suitable site for the proposed trials. The trial requires high disease pressure, which make siting of the trial a challenge. However, progress has been made by Sharon McFarlane to secure the land at the Malelane transplant nursery for observation plots.

General: FAS recommendations – Ambic and Truog-comparative recommendations- Is it possible to run a parallel system until growers are more familiar with the interpretation of results?	A	Two issues are to be considered: (a) A suitable P test is required for Northern Irrigated area (NIA) soils. The Ambic P test has been found to extract extremely low amounts of P on many irrigated soils, while the Truog test, being acidic, is highly unreliable on these soils. FAS is currently implementing the Resin test for NIA soils; this will be a very positive development for production in these areas. (b) It appears that field experimentation to establish P test thresholds has never been conducted in the NIAs. There is an urgent need for research of this kind to be undertaken, not only in the NIAs, but in the rainfed areas of the industry as well. The objective of the research to be conducted in 12CM02 is to refine the calibration of the resin-based P-test using data obtained from a trial sited on virgin land in the Komatipoort area.
General: Cane density/weight per m3 per variety to assist with loading parameters. The overloading of transport has become a major issue for growers with the implementation of new legislation. The grower, haulier and miller will be held accountable for overloading. The installation of “per axle” load cells are prohibitively expensive. Is it possible to have a comparative table for the factor to use in calculation of loads, or some alternative inexpensive method to use to determine an approximate weight per load	A	The request is for an estimate of the bulk density of cane varieties to assist with achieving maximum legal payloads during transport. However, bulk density is only one of the factors contributing to low payloads and having the bulk density value is unlikely to help. Other factors include, lodged cane, vehicle and loader design, poor harvesting and loading practices. The issue is also an industry one and not limited to the irrigated North. This was recognised around 5 years ago and the KZN mills have been working at remedying the problem with an industry load control programme, but, the other mills decided not to participate in the process. Hence, they are way behind in understanding the issue. The irrigated North has now realised that there is impending legislation with severe penalties for overloading and in trying to reduce their overloading they have increased their under loading. Five years ago it was recognised that 30% of sugarcane vehicles were overloaded, this resulted in unsafe vehicles, increased wear and tear and severe damage to the roads. In spite of this, the average vehicle was under loaded and 1 out of every 7 trips to the mill was unnecessary, resulting in a significant increase in transport costs. This showed the massive variation in loading accuracy, from severe overloading to severe under loading, a large standard of deviation of loading, mostly due to poor harvesting and loading practices. Initiatives during this time have led to a far more precise loading of the vehicles There was also a request for a simple inexpensive system to measure loads on vehicles; many people have tried to develop such systems and failed. However, many growers have succeeded in loading their vehicles very precisely without such systems and SASRI has produced a DVD in Zulu which shows very effectively, how to load a vehicle correctly. Feedback from growers is that this has been very helpful. There was also a comment that commercial weighing systems were prohibitively expensive, this is simply not true. Yes, they are expensive, but, tracking the performance of these systems over the last 6 years has shown that the payback period even in well managed operations has been less than 18 months and the systems are still in operation. In poorly managed systems the payback time will be even shorter. Conclusion • Harvesting and loading must be well managed, the SASRI DVD shows very effectively how this can be achieved. • Commercial weighing systems should be used, they are cost effective and make managing the payload a lot easier. • The rigid and drawbar vehicle, the most commonly used by the TSB mills does have a slightly lower volume than the common interlink vehicle used in KZN, which does aggravate their issue slightly and necessitates extra care during loading. However, heavier slewing type loaders are generally used in the irrigated North, which enables load compacting on the vehicles more effectively than the non-slew type common in KZN

Herbicides: The weed Rotboellia is a problem in the area and there is a need for an herbicide that can successfully control it. SASRI recommendations are not effective. Velpar is not recommended in the area	B	Established herbicide programmes exist for *Rottboellia* and are recommended by local consultants in Mpumalanga. It could also be an application problem. Dr Peta Campbell, the SASRI Weed Scientist, will liaise with Dr Pieter Cronje from TSB regarding specific and local weed problems. Extension services in the region may facilitate this visit through submission of an Extension Advisory Request.
Flowering and Pithing: The 2010 season showed heavy flowering- in non-flowering varieties (N25) excessive pithing (with and without flowers) was observed. What are the reasons for the pithing and how can this be managed. Year requested – 2010. The My Canesim model does not cover the request- is it possible to get information from production areas further North- Malawi?	B	A Knowledge Transfer Project (12KT04: Flowering and Pithing) will commence in 2013 under the leadership of Dr Alana Eksteen, the SASRI Plant Physiologist. Dr Eksteen will survey the world literature and liaise strongly with Extension to prepare a dossier on flowering and pithing. Initiatives put in place in 2012 will continue, particularly with regard to the e-mail communication sent to all Extension Specialists (ESs) including Mpumalanga & UCL on 2 April 2012.. ESs will continue to monitor the incidence of flowering and/or pithing during the season. This monitoring requirement will be included in the ESs Programmes of Work under section 2 (Issue Extension). The objective of this monitoring is to assess the incidences of flowering and pithing, whether flowering and pithing occur simultaneously, how much of the stalk is affected by pithing and what were the climatic conditions prior to the advent of flowering and pithing. Flowering and pithing seems to be more prevalent in the northern irrigated areas so attention to this monitoring in these areas is important. An E-mail was sent to Pieter Cronje on 22 May 2012 requesting a breakdown of varieties that are affected by pithing. In addition, an algorithm was developed to predict the extent of flowering using weather data and cultivar information. The flowering index will be implemented in the Weather Web as soon as the calculation of soil water content, which is a key driver for flowering, has been refined in the SASRI Metbase. The index will have to be evaluated by extension, after which it can be publicised in the Link.
Crop Model: Cane production potential models: What is the reason for difference between estimated potential and what is currently achieved? Can the accuracy be benchmarked?	C	The reason for the difference is that crop models assume perfect management, good nutrition and soil health and no disease, pest and weed damage. The accuracy of Canesim and Canegro has been determined. At a field level the accuracy for predicting cane yield (using the Canesim model) is about 20%, at a mill and industry level it is much less (11 and 4.4%), when the management factor is removed (AS). SASRI Regional Extension Manager for the southern regions of the industry, Dirk McElligott, briefly discussed this issue with Dr Peter Cronjé, who confirmed that he has detailed data for each individual grower in Mpumalanga and that he was aware of this project request from his growers. In addition, Dirk McElligott is currently leading a project entitled "Profitability of sugarcane growing" (11TD09) and he will extend the project to encompass the Mpumalanga region. Dr Peter Cronje might use Annual Yield Comparison spread sheets and collect individual grower data (yield, quality, revenue) on a ward basis. Data from a further SASRI projects (10SD05: Quantifying and diagnosing yield decline), which is managed by Matthew Jones, the SASRI Systems Modeller, will also provide information pertinent to this issue. With two SASRI projects covering this issue, now new project on this issue is planned for 2013/2014. However, it is likely that the current projects will only have useful information to answer this issue in 12 months' time.

Single budded sets: Information on how to set up and manage a single budded sett production scheme.	B	Useful information pertinent to this issue is contained in SASRI Information Sheet 9.2: "Transplants" . The document provides guidelines for transplant production. These recommendations relate to hot water treatment, germination conditions, planting, fertigation, trimming and weeding of plants. Furthermore, there has been some research conducted in the past on the use of transplants for nursery establishment. See Thomas, D.W (1984). The possible use of transplants for establishing seedcane nurseries. Proc S Afr Sug Technol Ass : 211-213 It is likely that the originator of this request would gain useful information through a visit to a well-organised seedcane nursery (the Sezela Seedcane Nursery is a possible choice) to view their operations and establish guidelines for the development of a similar scheme. Additional references: The Link, Vol 1, no. 1. October 1992, pg 1-2 The Link, Vol 7, no. 4. September 1998, pg 4
Breeding: In 2007 we did not have a good late season variety. After discussions regarding problems on varieties in the Mpumalanga area it was noted that it should be a priority to find disease resistant varieties for replanting. Year requested – 2007/08. Outcome - N49 seems to be an answer, but a wider selection and choice is still required. N46 not performing well, N53 still lacks data. Time of harvesting trials in Mpumalanga: October is too early- please harvest trails in November December- Data from October does not reflect end of season conditions.	A	All Plant Breeding Project late season trials in Mpumalanga and Pongola were harvested in the late season (October and after) in 2011. In the current season, the aim will be to harvest all these late season trials within the last four weeks of mill closure so they are in line with the late season crops found in the irrigated areas. The data emanating from these trials will be analysed to provide a direction and guidance to the Plant Breeding project on the way forward to address the need for high yield late season varieties.
P&D: Quantify the yield loss due to Thrips under irrigated conditions for both plant and ratoon crops.	A	A project commenced in 2012 to directly address this issue. The project is entitled "Yield loss due to sugarcane Thrips in annual drip irrigated sugarcane crop (11CP04)" and is being conducted under the leadership of Mike Way. The trial will be planted in September 2012 when prevailing conditions are suitable for investigation of the effects of Thrips on sugarcane.
Herbicides: Compare yield loss on plant cane when Velpar is used as opposed to the use of Metribuzin /Diuron/Gramoxone.	B	This is a long term project in the SASRI Programme of Work and is currently on hold due to lack of capacity. The project is entitled "Phytotoxicity of selected herbicides to new varieties" (00CP03) and will be conducted under the leadership of Dr Peta Campbell and Graeme Leslie. It is of note that Velpar has not been registered as yet and is an herbicide with which it is imperative not to overdose.
Ripeners: Volley – a cheaper generic of Fusilade Forte- is it directly comparable to FF and would recommendations regarding varieties and dosage remain the same	B	Commercial strip trial work, being conducted in collaboration with TSB Ltd, is currently evaluating the performance of Volley in relation to that of Fusilade Forte. The results of the study will become available in the second half of 2012. Both products have the same active ingredient, but at different concentrations. The respective product labels should always be consulted for the correct application rates.

Trashing: There is a need to more accurately determine the benefit of trash in providing nutrients to the soil and the time frame in which this takes place. General statements are made like “the full effects of nutrients becoming available are probably obtained over three years” the question is how much does become available in which year. It was noted that SASRI already has trash as one of the research projects and this has been going on for almost a year. The beneficial effect obtained from increasing the organic material in the soil has been shown on different levels but for the irrigated areas the effect on yield needs to be quantified. Value of trash in terms of fertiliser – more feedback needed on research. Some theories imply that plant can only take up food from trash after three years. We need clarity on this and confirmation on what the portion of the nutrients is, that will be taken up in the soil system and not be readily available to the plants. This information is required to have an accurate view on financial feasibility of a green harvesting system.	B	How rapidly does trash decompose? The decomposition of trash at the coast and irrigated areas is relatively fast, with about 3% of the original amount left on the surface at harvest still present at the following harvest. There is, however, not a build-up of un-decomposed trash on the surface as the years go by. Usually at the next harvest there is only about 3% of the original trash amount again present at the next harvest. What happens to the decomposed trash? The decomposed trash is broken into finer particles which are incorporated into the soil matrix, and constitute an important source of labile carbon in sugarcane soils. Labile carbon is fresh organic matter, which is an important source of food for microbes and earthworms. These organisms extract nutrients from the labile carbon for their growth and multiplication, and excrete plant-available nutrients. When they die, their remains contribute to the stabilized soil organic matter pool (humus). When are nutrients from the decomposed trash available for uptake by the crop? Due to the above processes, only a portion of the nutrients in the trash is available to the following crop. And all nutrients do not become available at the same rate. In the case of K, for example, reserves of this nutrient in the trash are readily extracted through leaching by rain water and nearly all is thus available to the crop in the first year. The P turnover is also relatively quick. Of the major nutrients turnover of N is, however, the slowest. The amount of N that is available in the first season is dependent on a wide range of factors which include history of the field, sugarcane variety, climatic region, current climatic conditions, etc. In general about 40 to 60% of N from the trash is available to the crop in the first year. In the second year 40 to 60% of the remaining N becomes available and similar percentages in the third and following years. When management of a field is changed, it will take the field about 5 years (depending on a number of factors, including those listed above) to come into equilibrium with the new practice. This means that after equilibrium has been reached plant nutrient contributions from trash will be at a peak. How do we account for the nutrient supply from the soil? A soil that receives a regular supply of organic matter will have higher organic matter content (both in terms of dead plant material and dead and alive micro-organisms) and therefore also higher nutrient reserves. To accommodate this in the management of a sugarcane crop it is best to have soil and leaf samples analysed regularly. The more favourable nutrient supplies resulting from trashing will be reflected in the analyses, thereby enabling reductions in fertiliser requirements to be realized. Effects of trashing on cane yields under irrigated conditions? There is a current research project in progress that is investigating the effects of trashing on cane yields under both rainfed and irrigated conditions. Results will be communicated once sufficient results have been obtained.
Irrigation Scheduling: Scheduling – progress as to the request to determine the point at which stress occurs in terms of centibars.	B	This issue is currently being addressed within the project entitled “Farm-level water allocation decision support program based on crop response to deficit irrigation” (Project 09CM06) which commenced in April 2011. Crop response to soil water status are being measured on the Komatipoort research station and on commercial fields. Preliminary results addressing this specific issue are likely to be available by April 2013.

General: Development of technology re GPS planting and mechanisation- Overview of available information	B	GPS systems are usually supplied by agricultural equipment suppliers as optional extras or for subsequent retrofitting. Examples include Green Star navigation (John Deere), PLM (precision land management – New Holland) and AFS AccuGuide (Case IH). The GPS receiver, operator console, auto steer, mapping units are typically part of a suite of commercial hardware and software products offered relating to precision agriculture technologies. Examples of agricultural GPS systems include Trimble, Topcon, Dickey John, Ag Leader, etc. Typically a rover unit is required for tractor/implement and base station (usually shared over wider area). GPS is only required for precision agriculture systems such as harvesters/loading systems where control traffic is to be strictly practiced.
General: Climate change- wetter start and finish of season- how to cope- Overview of available information	B	Various options are available to ameliorate any potential negative effects of wetter season starts and finishes, including: • Farm management practices 1) Harvest wet or fields prone to water-logging during the drier mid-season. Regardless of whether soils are compactible or not, harvesting during wet conditions will exacerbate the damage caused by harvesting operations (stool disturbance). 2) When burning, consider reducing area burnt to ensure that no cane is left unharvested at the end of a day. Burnt cane in wet soils deteriorates most rapidly. Consider green harvesting under these conditions. In extreme cases e.g. rain after a field is burnt it may be necessary to carry harvested cane out of fields rather than cause mechanical damage and compaction. 3) Herbicide – shift in type and timing of herbicides (programming). 4) Nutrition – Avoid N volatilisation. Split N treatments, avoid urea etc. 5) At plough out re-assess the need for drainage structures. • Controlled Traffic Systems Developing controlled traffic systems to cope with wetter fields (dedicated roads, traffic zones and alternating crop/production zones). The experiences of the Colombian industry may be useful in planning the way forward, as they have two wet seasons during their harvesting cycle and wet conditions in which they harvest. In this regard, the work of Torres may be useful (Torres JS and Villegas F (1992) Differentiation of soil compaction and cane stool damage. Proc Intl Soc Sugar Cane Technol pp 294-305; Torres JS, Yang SJ and Villegas F (1989) Soil compaction and sugarcane stool damage due to semi-mechanized harvesting in the wet season. Proc Intl Soc Sugar Cane Technol pp 992-1000. Also there are examples from Australia where chopper harvesters are able to operate under waterlogged conditions because of controlled traffic systems. • Length of the Milling Season A project to take a fresh look at issues around the length of the milling season (LOMS) is being planned by Professor Carel Bezuidenhout of the School of Engineering at the University of KwaZulu-Natal. This study might provide useful information for planning, should the wetter season starts and ends persist. Bezuidenhout, who occupies the SASA Research Fellow position at UKZN, has also investigated the use of chopper harvesters in Eston to reduce no cane mill stops due to labour unavailability primarily associated with pay weekends. This study considered a novel means to reduce the effect of harvest delays (Kadwa M, Bezuidenhout CM and Ferrer SRD [2012] Cane supply benefits associated with the mitigation of labour absenteeism in the Eston sugarcane supply chain. Proc S Afr Sug Technol Ass 85: 47-49). Changing milling season: See Mc Donald, L (2006). The effect of time of ratooning on sugarcane growth in the Burdekin. Proc Aust Soc Sugar Cane Technol 28, 261-272.

		See Chapter 10 (particularly p132-133) of Donaldson, RA (2009) Season effects on the potential biomass and sucrose accumulation of some commercial cultivars of sugarcane. PhD thesis.
General: With the roll-out of the revised SUSFARMS® imminent, the need for a Farm Planning service and especially land use plans has been highlighted. The desktop based system envisaged for this role will lack proper soil information- how will this issue be addressed?	A	SASRI does not currently offer a Land Use Planning service or a Soil Survey service to the Industry. The current strategy is that where possible, two Durban-based Extension Specialists (ESs) will provide support to regionally-based Extension Specialists in the drafting Land-Use Plans. (LUPs) In requesting assistance, Extension Specialists are requested to use the SASRI Extension Request for Advice (ERA) system. Two SASRI Interns have been trained in the drafting of LUPs in order to provide further support to Extension. They have developed a system of drafting LUPs on PCs using free software, which is compatible to ArcView. The Interns will visit each extension area in KZN and do the following: • Ensure each extension office has the relevant base data of digital aerial photography and digital contour lines on their external hard drive. • Load the new free software onto the ESs laptop. • Train the ES on how to use the software to view the data. • Train the ES on how to draft a land use plan using the new software. They will be contacting each ES shortly to set a date. The ES will be expected to draft LUPs for their own growers. However, should the demand for LUPs exceed the ESs capacity, the ES can send in an ERA for assistance in drafting LUPs. SASRI does not offer soil surveys as a service. However, each ES is expected to be skilled in identifying soils and should be in the position to decide on the size of survey he/she can handle.
Dry-off: A workshop on dry-off- the benefits and methodology and appropriate recommendations for Mpumalanga.	B	A project (11KT03: Clarifying best management practice for drying off) was initiated in April 2012 under the leadership of Francois Olivier to address this issue. A desktop study will be completed in mid-2012 and a draft document will be workshopped in the latter half of the year. This information will then be made available to Stakeholders.
Novacane®: The cost and benefit analysis for the use of tissue culture plants in a seed-cane scheme as compared to heat treatment	B	SASRI and the industry Principals are concerned about the termination in production of NovaCane® plants from Du Roi, and recognise the value of this technology for the industry, both in respect of production of new varieties and also to enable production of large volumes of plants that would be required in response to devastating pest and disease incursions. SACGA have produced a series of spreadsheets that reflect the number of NovaCane® plants that would be required should the industry wish to use this technology as a source for all seedcane schemes to support the industry. Costs were based on the DuRoi prices and their ability to provide the requisite material. This study will be of value in assisting the industry to make a decision about the future of NovaCane®. Urgent meetings are being held to discuss the most appropriate manner in which the industry should support NovaCane® production in the near future.

Breeding: Genetic “resuscitation” due to tissue culture- can this be quantified and used as off-set on the cost of using tissue culture plantlets to establish nurseries. Year requested – 2010.	B	There is no scientific evidence for ‘genetic resuscitation’ in the international literature on sugarcane. Based on scientific evidence, any yield benefits reported have been attributed to elimination of pathogens from tissue culture plants. SASRI is conducting a field trial at Komatipoort to gain insights into seedcane yield from NovaCane® plants compared to commercial plantings for 6 varieties over many crops. Thus far, the plant crop results have shown that the commercial plantings out-yielded tissue culture plants in terms of cane tonnage and RV yields. Results from the 1st ratoon will be gathered in mid-2012 to confirm these interim findings.
General: Available training courses- Please update	B	SASRI conducts two certificate courses in sugarcane agriculture – a three week Junior Certificate Course and a more extensive five week Senior Certificate Course. Both courses are conducted in English at the SASRI site in Mt Edgecombe, Durban. The Junior Course is aimed at junior farm managers, agriculture students and farm clerks while the Senior Course is attended by more experienced farm managers, farm owners, agriculture students and sugarcane researchers Course fees, application procedures and closing dates are indicated on separate application forms that can be downloaded from our website at http://www.sasa.org.za/EDUCATION94.aspx or obtained from the course coordinator, Mr Raj Balbador at educane@sugar.org.za
General: Variety Chart- Please update, print and make available	A	These charts have been completed and are available at all Extension offices.
Novacane®: Recommended protocol for the use of tissue culture plants in a seed-cane scheme.	A	Row spacing information for transplants was obtained from D McElligott. He recommends a 1 m row with plant spacing of 500 mm (i.e. 20,000 plants/ha). This is what is recommended for NovaCane® in the SASRI NovaCane® planting guide. However, Sezela Transplant nursery seems to be in the process of changing this to 400 mm as this improves canopy development and increases plant population. From direct experience in Midlands with NovaCane®, the following observations were made: (a) At the Eston centralised nursery (Tala Valley – G Gurney’s farm with supplementary irrigation) NovaCane® plants were planted at 1,25 m row width and 600 mm plant spacing as is the practise for this farm. After 6 months (spring plant), an average of 30 tillers per stool was observed. (b) Midlands North seedcane scheme has used the standard 1 m row width and 500 mm plant spacing for establishing NovaCane®.
General: Residual chemicals – MSMA and Arsenic on sugar crystals?- Food safety issue	A	This issue pertains to food safety and agro-processing and is beyond SASRI's core areas of competence and industry mandate. Stakeholders are advised to consult other institutions or SASA divisions that may possess the expertise to provide an informed professional opinion: (a) External Affairs Division of SASA (031 508 7025); or (b) Sugar Milling Research Institute (031 273 1300).

PONGOLA: IRRIGATED NORTH REGION		
Diseases: Research on the “Ash” rust	A	A project proposal entitled "African sugarcane rust: Description, biology and control" has been prepared that includes the following: - The description and naming of the fungus, which will be done in collaboration with the USDA-ARS in Florida. - Diagnostic assay (specific PCR) will be developed to distinguish African sugarcane rust from brown and orange rusts. - Fungicide trials have been planned for August / September 2012 when African sugarcane rust is expected to reappear. The trials will also be used to assess yield losses associated with the disease. - Observation plots to monitor infection and the weather conditions favouring the development of the disease. Plots of N46 have been planted adjacent to the Automatic Weather Stations at the Pongola and Komati Research Stations as part of a project that is developing a rust risk model (10CP04). - Screening of released varieties, assessment of susceptibility of genotypes / families to African sugarcane rust. - Identification of genetic markers for resistance to the pathogen causing the disease. In addition, Local Pest, Disease and Variety Control Committees and their teams have been asked to monitor the disease. Training on the identification of the disease will be provided by SASRI.
Weed control: Cynodon, water grass & Rottboellia is becoming a very serious problem. Expand the research and give greatest attention.	A	Established herbicide programmes exist for *Rottboellia* and are recommended by local consultants in Mpumalanga. It could also be an application problem. Dr Peta Campbell, the SASRI Weed Scientist, will liaise with Dr Pieter Cronje from TSB regarding specific and local weed problems.. Extension services in the region may facilitate this visit through submission of an Extension Advisory Request. For *Cynodon*, one new herbicide has been registered for control, which will be launched later in 2012. One of the outcomes of a current SASRI project (06CP15) is an Integrated Pest Management manual for creeping grasses. In addition, new chemicals are being screened in a long term project that searches for new herbicides (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control).
Ripeners: Alternative for hormonal ripeners (Ethephon) that will not affect other crops	A	Fusilade Forte or the generic, Volley, will not affect broad-leaf crops (tomato, green pepper, butternut etc.). No other non-hormonal chemistries are currently available as potential ripeners. When sensitive cash crops in nearby fields are an issue, Fusilade Forte/Volley should be the ripener of choice. The application of Ethephon should be done with caution under conditions where the risk of drift is minimal.
Harvesting: What are the economics of aging the cane vs. annual cycle in Pongola & Irrigated North?	B	Variety trial data suggest that cane harvested at approximately 15 months of age in the irrigated North can produce up to 2 tons RV/ha benefit relative to 12 month old cane. The implications of increasing the harvest age on lodging and Eldana were not considered in these trials. More trials have to be analysed and if there are promising results without associated losses, then the concept may be taken further, and an article in The Link may be produced. This may then justify more research into the appropriate harvest age of varieties in the irrigated north.

Transport: When does it become uneconomical to transport your own cane?	A	The annual mechanisation costing report is available on the SASRI website to determining life cycle costs (Report entitled "Costing machinery Systems" at http://www.sasa.org.za/divisions/SASugarCaneResearchInstitute/Publications.aspx). In the report, methodology is described in detail on how to cost out an operation. These are, however, not directly comparable with actual costs that may include financing charges (for cash flow purposes), profits, ancillary operating expenses and tax implications. Expert financial planning and costing advice should be sought from an agricultural economist. Another method is to do a life cycle cost of a well utilized piece of equipment and compare this to an own scenario case to see what the premium is to own the equipment. Alternatively growers should get actual quotes to purchase equipment (Financing, owning, maintaining and running the equipment) and quotes from a contractor in order to determine which the best option is. Sensitivities to various parameters such as fuel, lead distance, interest rates, payload etc. have been explored in an earlier (February 2009) article in The Link (Tweddle P [2009] Reducing transport costs: Where to focus? *The Link* 18 [1]: 18-19).
SWAZILAND: IRRIGATED NORTH REGION		
Nutrition: Issue 1: What are the leaf nutrient threshold values for the newer sugarcane varieties (i.e. N19, N23, N25, N26, N36, etc)? Background: Leaf nutrient threshold values for NCo376 and N14 are known. These are not known for the newer varieties – making it difficult to monitor nutrient uptake efficiency. Desired end result: Establish leaf nutrient threshold values. Possible monitoring of nutrient uptake hence improved fertiliser use efficiency.	A	The development of reliable leaf nutrient thresholds, particularly for N, is a high-priority in SASRI's research programme. Current initiatives in this regard include: 1. Project 09CM02 investigates the responses of varieties to N in dryland and irrigated areas. It is envisaged that this project will contribute significantly to the refinement of leaf N thresholds for important varieties. 2. Project 08RE05, which examines responses to N, K and Si under dryland conditions, will contribute to the development of more robust thresholds for these nutrients. 3. Project 09CM01, involves numerous N response trials in dryland areas. This project has the objective of developing a more reliable soil test for N (to replace the 'N category' approach); however, the derivation of leaf N thresholds will form a part of this study. Although varietal differences in N thresholds may be significant, the variation in leaf N threshold with crop age (biomass) is thought to be of far greater importance. With this in mind, a proposal for a research project is under development. The project is entitled "Development of reliable leaf nitrogen threshold values" and the study will focus on investigating the relationships between biomass and N thresholds. In terms of variety-specific thresholds for nutrients such as P and K, it should be borne in mind that detailed and costly field trial programmes are necessary for the determination of such thresholds. With N being the major driver in ratoon growth, SASRI will focus available research capacity on this nutrient in the interim.

Tissue Culture: Issue 3: What is the ideal intra and inter-row spacing for tissue culture plantlets in a seedcane nursery scheme? Background: Currently tissue culture (TC) plantlets are planted at 50 cm apart within a row. How does the yield compare with a nursery established using double stick in the conventional method? What is the ideal spacing for a seedcane TC nursery that will be ploughed out after the first ratoon? Desired end result: Quantify the ideal intra-row and inter row spacing for a TC seedcane nursery.	A	Row spacing information for transplants was obtained from Dirk McElligott, the SASRI Regional Extension Manager for the southern regions of the industry. A 1 m row with plant spacing of 500 mm (i.e. 20,000 plants/ha) is recommended. This is what is recommended for NovaCane® in the SASRI NovaCane® planting guide. However, Sezela Transplant nursery seems to be in the process of changing this to 400 mm as this improves canopy development and increases plant population. From direct experience in Midlands with NovaCane®, the following observations were made: (a) At the Eston centralised nursery (Tala Valley – G Gurney's farm with supplementary irrigation) NovaCane® plants were planted at 1,25 m row width and 600 mm plant spacing as is the practise for this farm. After 6 months (spring plant), an average of 30 tillers per stool was observed. (b) Midlands North seedcane scheme has used the standard 1 m row width and 500 mm plant spacing for establishing NovaCane®.
Nutrition: Issue 2: How do you sample your soils under subsurface drip irrigation? Is the available soil sampling equipment still effective, given the placement of the nutrients when fertigating? Are we not under/over-estimating the available nutrients? Background: The available sampling procedure was designed for surface application of nutrients (broadcasting or banding). Desired end result: Suitable sampling procedure/suitable sampling equipment.	A	It is important to recognize that sub-surface drip is simply another form of band-placement. Therefore the Beater sampler should be used, with a 20 cm sampling depth. One core should be taken immediately above the dripper line and eight in between dripper lines. A single sample should comprise at least 30 cores. In addition to soil samples, leaf samples should be taken from each crop; these will contribute to more efficient nutrient management.
UMFOLOZI: IRRIGATED NORTH REGION		
P – Deficiency or Plant available P: Are the right phosphorus recommendations being made? How available is the phosphorus to the sugarcane plant?	A	Two issues are to be considered: (a) A suitable P test is required for Northern Irrigated area (NIA) soils. The Ambic P test has been found to extract extremely low amounts of P on many irrigated soils, while the Truog test, being acidic, is highly unreliable on these soils. FAS is currently implementing the Resin test for NIA soils; this will be a very positive development for production in these areas. (b) It appears that field experimentation to establish P test thresholds has never been conducted in the NIAs. There is an urgent need for research of this kind to be undertaken, not only in the NIAs, but in the rainfed areas of the industry as well. The objective of the research to be conducted in 12CM02 is to refine the calibration of the resin-based P-test using data obtained from a trial sited on virgin land in the Komatipoort area.
Weed Control: Effective control of Rottboellia conchinchinensis.	A	Established herbicide programmes exist for *Rottboellia* and are recommended by local consultants in Mpumalanga. It could also be an application problem. Dr Peta Campbell, the SASRI Weed Scientist, will liaise with Dr Pieter Cronje from TSB regarding specific and local weed problems.. Extension services in the region may facilitate this visit through submission of an Extension Advisory Request.
Thrips: Application Methods: What is the best time to spray, how often should, especially plant cane, be sprayed? When should spraying stop? How sensitive are the chemicals to UV? Can it be mixed with Herbicide?	A	An updated Link article covering the use of Bandit for Thrips control will appear during 2012. For when, how and frequency of spraying, growers are referred to the product label. Additional information of interest will be included in a Link article on ongoing SASRI research into pesticides and pest control.

Thrips: What research is being done with regards to long term control?	B	For long-term, sustainable control of Thrips, variety resistance is to be actively pursued in the SASRI Breeding Project (00VI01). Planning is underway to enable the monitoring of Thrips numbers simultaneously to the current Eldana resistance screening programme for varieties. This would then become a routine programme complementing other initiatives (e.g. agro-chemical and crop management research) towards the long term control of Thrips.
Nematodes: How much effect are Nematodes having on the crop at Umfolozi and how should we be controlling nematodes in the long and short term now Temic is no longer available?	C	A nematode variety evaluation trial in Umfolozi, as part of Project 00CP01 (Variety Evaluation - Nematodes), has been planned for 2013. In the interim, estimates of crop loss due to nematodes in Umfolozi will be made based on the nematodes that are found in that area, the varieties that are grown and the soil types that exist. These results will be used to compile an extension newsletter targeted specifically at the Umfolozi mill area. Regarding nematode control, the January 2011 article in The Link entitled “Nematicides for sugarcane in South Africa”, summarizes the costs and profits associated with using the most common nematicides in the South African sugar industry. Research is currently focusing on finding a replacement for Temik. A long term project on alternative chemistries was initiated in April 2012 (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control). In addition, the article: “More nematicide trials. Looking for a replacement for Temik” in the May 2012 edition of The Link provides information on the current trials focusing on a replacement for Temik.
Soil Health: Practical composting methods for sugarcane farms. Use and efficiency of compost teas in improving soil health.	C	The issue of on-farm composting was also raised by growers in 2011. In response, SASRI decided to compile and communicate current knowledge on on-farm composting in an article in The Link and to prepare a presentation, which can be used at grower days. This article will be published during 2012. The article (and presentation) will provide information about the basic composting process, introduce possible compost ingredients and their properties, explain how to get the correct mixture of ingredients, describe the factors influencing the composting process (temperature, moisture, density, aeration, site layout, pile geometry), present the most common composting methods and give recommendations for usage and application of the final product. In addition information is currently being collected from successful composting operations in various parts of the sugar industry. This information will be conveyed in a second article in The Link as “case studies”, which will describe two or three practical examples and gives insight into specific problems/challenges on-farm composters are facing.
SSG Request: What is effective nutrient uptake on a 24 month cycle?	C	Most of the N and K is taken up during the first six months of active sugarcane growth. There is less certainty regarding the pattern of uptake of the other nutrients. This issue will form part of SASRIs Knowledge Management Unit's Information Sheet updating schedule. Besides a new Information sheet, this will also involve looking at and updating current Information sheets on this topic, as required.

Mechanisation: What is the effect of deep ripping on alluvial soils?	C	Alluvial soils consists of a collection of different textured layers (ranging from sand to clay) of various depths (few mm to > 500 mm). Each layer has its own susceptibility to compaction which will restrict water infiltration and root penetration. During the growing season a pit should be opened and the profile examined for signs of water logging, anaerobic conditions and restricted rooting depth. Only where signs of one or more of these conditions are present should deep rip be considered. Ripping depth should be restricted to just below the layer at depth responsible for the undesirable soil conditions. Ripping of alluvial soils will result in a mixing of the layers that the ripper tine is cutting. This might result in a beneficial or detrimental effect depending on the textural composition of layers disturbed by the ripper. A beneficial result could be a breakup of the restricted layer(s) leaving a layer that is more resistant to compaction (and thus the creation of an impermeable layer to water and roots). An undesirable result could be a layer that is more susceptible to compaction. To improve the probability of a beneficial result to ripping, the incorporation of substantial amounts of organic matter (at least 30tons/ha) on the ripper line should be considered. The organic matter will keep a passage open to the deeper soil layers for longer to facilitate drainage of excess water and allow roots to penetrate greater depths.
Nutrient Uptake: When, during the sugarcane plant's life cycle and stage of the season, is the most optimum time to be applying nutrients? How does the plant utilise available nutrients during its lifecycle?	C	Most of the N and K is taken up during the first 6 months of active growth. There is less certainty regarding the pattern of uptake of the other nutrients. This issue will form part of SASRIs Knowledge Management Unit's Information Sheet updating schedule. Besides a new Information sheet, this will also involve looking at and updating current Information sheets on this topic, as required.

Issues, Description Of Issues and Background	Rating	Communiqué to RD&E Committees from SASRI Specialists
MIDLANDS: COMBINED REGIONAL PRIORITY ISSUES		
Issue 5 – Fastac use – 2 year cycle: Describe the issue: We still need to grow 24 month cane – Economics. Background: Infestations of Eldana increasing – Eston/Midlands. End result: Guidelines for use on 2 year cycle.	A	Proposed use of Fastac in Midlands will be considered with the long-term project 00CP04 (Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control).
Issue 9 – Cane cutter – Nutrition and Hydration: Describe the issue: Cutter performance. Background: Drop in productivity. End result: Improved cane cutter productivity	C	The nutrition department of the South African Sugar Association has published recommendations for nutritional supplementation for cane cutters. These recommendations have been published in the South African Cane growers Association newsletter "The Canegrower", September 2007, Volume 14, Number 6, Page 2. More information on canecutter nutrition can be obtained from the SASA Nutrition department: The South African Sugar Association Nutrition Department - External Affairs 170 Flanders Drive, Mount Edgecombe, 4300 Tel : 031 508 7036 Fax : 031 508 7191 Email : nutrition@sasa.org.za
Issue 7 – Rust fungicides: Describe the issue: Amistar, Abacus. Background: Two products on the market. End result: Which product is more cost effective?	B	Abacus® is currently the only product registered for the management of brown rust on sugarcane. Amistar Top® was tested in the same trials as Abacus® and was not as effective in reducing disease severity and improving yields. A new product with the same active ingredients as Abacus® is being tested by Syngenta but since the product has not as yet been registered for use on sugarcane, it cannot be recommended. Canegrowers are investigating the economics of applying the registered fungicide (Abacus®) for brown rust management. If new products are found to be effective against the disease and are likely to be registered, they will be included in the assessment.
Issue 2 – Running grass control: Describe the issue: Current chemicals and management practices proving inadequate. Background: Ineffective control measures resulting in widespread infestations. End result: Effective chemical control of running grasses. Research into Laudis Concoction	A	One herbicide has been registered for control, which will be launched later in 2012. One of the outcomes of a current SASRI project (06CP15) is an Integrated Pest Management manual for creeping grasses. In addition, new chemicals are being screened in a long term project that searches for new herbicides (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control).

Issue 11 – GM Cane: Describe the issue: Can we get GM products (commercial) before other sugar producing countries. Background: To become more competitive. To increase and sustain yields. End result: Be first to market	B	Commercialisation of GM sugarcane is complex due to the high costs of licensing fees for patented genes of interest from multinational companies and the relatively small size of the SA industry, which restricts the interest of these companies in the SA market. A SASTA paper in 2012 (Snyman SJ and Meyer GM [2012] Improvement of sugarcane in South Africa using genetic engineering: Requirements for potential commercialisation. *Proc S Afr Sug Technol Ass* 85: 96-101) summarised industry decisions that need to be made in order to pursue a commercial GM approach. It is likely that Brazil will be first to market with GM cane, which will be developed and marketed by Monsanto.
Issue 1 – Temik Replacements: Describe the issue: What are the best alternatives currently available? (cost effectiveness and environmentally friendly). Background: Temik has been withdrawn. End result: Equal to or greater than Temik. Minimize environmental impact.	A	The January 2011 LINK article "Nematicides for sugarcane in South Africa" describes the cost and profits associated with the most commonly used nematicides in the South African sugarcane industry. With regards to their safety, Curaterr and the Vydate GR formulation are yellow label products and are therefore safer than Temik. Cropguard and the Vydate SL formulation are red label products and are therefore as toxic as Temik. In general, liquid formulations of nematicides are red label products and more toxic than the granular forms. Research is currently focusing on finding a replacement for Temik. A long term project on alternative chemistries was initiated in April 2012 (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control). The article: "More nematicide trials. Looking for a replacement for Temik" in the May 2012 edition of the LINK provides information on the current trials focusing on a replacement for Temik.
Issue 8 – Varietal susceptibility to Nematodes: Describe the issue: We do not have a rating for these new varieties. Background: New varieties – sandy soils – we don't know their tolerance to Nematodes. End result: Susceptibility rating for new varieties.	B	All released varieties are routinely screened for their susceptibility to nematodes, a process that forms an ongoing SASRI Project (00CP01: Variety Evaluation - Nematodes Project). Upon release to the industry, new varieties enter the variety evaluation project where resistance ratings are assigned. However, it should be noted that the accurate determination of variety responses to nematodes requires large data-sets that are collected over a number of years.
Issue 3 – Yellow leaf syndrome/Virus. Describe the issue: Is yield loss associated with YLS? Background YLS is becoming more prevalent especially on N12. End result: What is the economic impact? Are there resistant varieties? Are there any other control measures?	A	A project was initiated in 2009 (07CP04: Consequences of SCYLV infection on five rain-fed and one irrigated sugarcane variety) to assess the effect of SCYLV infection on five sugarcane varieties (NCo376, N12, N31, N33 and N39). Results suggest that of the varieties being tested, NCo376 is the most susceptible to infection and yield loss. While N12 and N31 also appear to become infected relatively quickly, yield loss has been lower in these varieties. There was an average loss in cane yield of 17% in the first ratoon crop. The trial will be finalised in September 2012, at which time more information on yield loss associated with SCYLV will be available. A survey conducted in the southern parts of the industry in February-March 2012 indicated that SCYLV is widespread in the coastal areas. Incidence was lower in the Midlands where conditions are less favourable for the aphid vector. SCYLV was detected in N12 in the Midlands but the incidence did not suggest that the variety was more susceptible to infection than other varieties being grown in the area. Similar surveys will be conducted in the northern parts of the industry in 2013. SCYLV can be managed through varietal resistance and healthy planting material. Since the disease is present on the SASRI research stations, natural selection of those varieties with more resistance to yield loss should occur over time. Infected cane does not always show symptoms so it is not possible to routinely inspect for the disease. Leaf samples from seedcane sources can however be sent to SASRI for testing.

Issue 4 – IPM: Describe the issue: Practical implementation of IPM. Background: Practicalities surrounding IPM. End result: Need an implementations strategy for IPM. Case study outcomes.	B	Combating Eldana remains a priority research area at SASRI, focusing strongly on the selection of Eldana resistant varieties. Complementary research at the institute is aimed at developing an integrated approach to minimising the negative effects of this pest, which includes crop nutrition, crop husbandry, judicious pesticide application strategies and habitat management. SASRI is also at an advanced stage of assessing the potential of Sterile Insect Technology in managing Eldana numbers (this is the approach that has been so successful in managing coddling moth in the citrus industry). It is note that there are currently ten research projects addressing aspects of Eldana IPM. In addition, an IPM manual for Eldana control is in development (SASRI Project 11KT04: IPM Manual for Eldana) under the leadership of Dr Stuart Rutherford. Innovative Integrated Pest Management approaches, including habitat management ("push-pull"), are to be steadily rolled out through Extension and Pest and Disease structures, including Grower Days, articles in The Link and the IPM Manual, once completed.
Issue 6 – Snake oils/Nitrogen: Describe the issue: Uncertainty over the effectiveness of these products. Background: Many sales people peddling various wonder products. Cost of N. Organic vs Chemical. End result: More of these products to be tested and scientific results to be published	C	• SASRI does not have the capacity to test the many products that come onto the market each year. • Research, both locally and overseas, indicates that 'wonder' products are invariably of little or no value in terms of improving soil health and crop yields. Growers are therefore cautioned to steer clear of untested products. • In any event, the purveyor of a product should be required to demonstrate its effect by first applying it to a strip of sugarcane, before it is used on the crop as a whole.
Issue 12 – Nutrition/Liming: Describe the issue: Application has led to visual cane damage/scorching. We don't know if it works. Background: Calcium sulphate as a spike in CMS. Result: Does it work	B	Growers need to be aware that indiscriminate mixing of products invariably results in problems. In the case of CMS, this product has limited capacity to solubilize other chemicals; this means that segregation in the CMS tank is likely to be a problem, while large concentrations of solids may be deposited on crop leaves. It is the responsibility of the CMS suppliers to ensure the efficacy and safety of their products (SASRI does not have the capacity to test the many CMS formulations being promoted in the industry).
Issue 10 – Green manures as cash crops: Describe the issue: Can we make money from the cash crop? Background: Enhanced cash flow in the farming system with cash crops e.g. cannabis sativa. End result: To improve soil health. Plus get a return from the green manure crop with degrading the soil further.	C	A project (08RE07: Critical evaluation of a sugarcane-soybean crop rotation system in the South African sugar industry) is currently underway, examining the general benefits and challenges of using a crop rotation (as opposed to a straight green manure/cover crop) with sugarcane. Soybeans were chosen as the study crop. Unfortunately, although SASRI strongly acknowledges the importance of crop rotation and its benefits in terms of soil health, SASRI has not been given the mandate to study cash crops other than sugarcane. Cedara/Department of Agriculture is a good source of information on alternative crops. Rob Osborne (Head of Horticulture) 033 3558140 or Vlatko Katusic (extension officer and an experienced vegetable grower) 031 3022848 can be contacted for advice on cash crops other than sugarcane. SASRI can be contacted for advice on correct fertiliser management for sugarcane grown after such crops.

Issue 13 – Slew loaders: Describe the issue: Stool damage through Bell loaders. Background: Older slew loaders too big/impractical. Result: Are there better/newer/smaller alternatives	B	SASRI has conducted a literature study to determine the impacts of field traffic on field damage and estimated yield losses. However, very little data on three wheel non-slew loaders is available from the literature. An interim report from the SASRI archives indicated a small but not significant yield response due to traffic by a Bell loader for that particular trial. Stool damage is generally shown to have a negative impact on yield. Hence, SASRI promotes the concept of controlled traffic systems, in which vehicle tracks of all equipment are kept away from the crop. This requires a matching of wheel track spacing and crop spacings. The degree of impact varies on many factors and can be negligible under certain conditions, while being severe under other conditions (up to as much as 50% yield loss on subsequent ratoons). New generation loaders available/present locally, include: John Deere slew loaders: 2 models namely the 1850 (90 degree slew) and the 2254 (180 degree slew) Matriarch slew loader being developed in Empangeni: www.matriarchequipment.com Chinese loader: http://www.tagrm.com/list.php?id=23&gclid=CJGx5fqhqrACFUYntAodMyyjVw -Mr A Braithwaite (Noodsberg); Various excavators converted grabs for loading cane: Mr R Saint (South Coast), Mr R Crookes (Eston) International loaders: Mauritius: Terex wheeled excavator loaders Chinese loader: http://www.tagrm.com/list.php?id=23&gclid=CJGx5fqhqrACFUYntAodMyyjVw ; Santal/Motocana CMP loader Walpeco Sermag SR8000 loader
ESTON: MIDLANDS REGION		
Eldana: Will Fastac be as effective on sugarcane grown on a 2 year cycle as it is when applied to sugarcane growing on an 18 month cycle? Would there be an economic benefit if applied aerially during both Moth peaks i.e. 12-16 applications?	A	Proposed use of Fastac in Midlands will be considered with the long-term project 00CP04 (Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control).
Running grasses continue to be a big problem: Latest recommendations required. Are there other products registered that are better than Glyphosate. If not, why?	A	One herbicide has been registered for control, which will be launched later in 2012. One of the outcomes of a current SASRI project (06CP15) is an Integrated Pest Management manual for creeping grasses. In addition, new chemicals are being screened in a long term project that searches for new herbicides (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control).
Genetically Modified Sugarcane: When will SASRI produce GM cane ready for planting as commercial cane?	B	Commercialisation of GM sugarcane is complex due to the high costs of licensing fees for patented genes of interest from multinational companies and the relatively small size of the SA industry, which restricts the interest of these companies in the SA market. A SASTA paper in 2012 (Snyman SJ and Meyer GM [2012] Improvement of sugarcane in South Africa using genetic engineering: Requirements for potential commercialisation. Proc S Afr Sug Technol Ass 85: 96-101) summarised industry decisions that need to be made in order to pursue a commercial GM approach. It is likely that Brazil will be first to market with GM cane, which will be developed and marketed by Monsanto.

Sugarcane yellow leaf luteovirus: N12 has been identified as susceptible in the Midlands South. How big is the threat to the industry and do you have varieties that are resistant to (ScYLV) ?	A	A project was initiated in 2009 (07CP04: Consequences of SCYLV infection on five rain-fed and one irrigated sugarcane variety) to assess the effect of SCYLV infection on five sugarcane varieties (NCo376, N12, N31, N33 and N39). Results suggest that of the varieties being tested, NCo376 is the most susceptible to infection and yield loss. While N12 and N31 also appear to become infected relatively quickly, yield loss has been lower in these varieties. There was an average loss in cane yield of 17% in the first ratoon crop. The trial will be terminated in September 2012 and more information on yield loss associated with SCYLV will be available.
IPM: Are there working models in the industry that can be used to promote IPM?	B	Combating Eldana remains a priority research area at SASRI, focusing strongly on the selection of Eldana resistant varieties. Complementary research at the institute is aimed at developing an integrated approach to minimising the negative effects of this pest, which includes crop nutrition, crop husbandry, judicious pesticide application strategies and habitat management. SASRI is also at an advanced stage of assessing the potential of Sterile Insect Technology in managing Eldana numbers (this is the approach that has been so successful in managing coddling moth in the citrus industry). It is note that there are currently ten research projects addressing aspects of Eldana IPM. In addition, an IPM manual for Eldana control is in development (SASRI Project 11KT04: IPM Manual for Eldana) under the leadership of Dr Stuart Rutherford. Innovative Integrated Pest Management approaches, including habitat management ("push-pull"), are to be steadily rolled out through Extension and Pest and Disease structures, including Grower Days, articles in The Link and the IPM Manual, once completed.
When green manures are treated as cash crops. Can SASRI include green manures to generate extra cash flow i.e. Cannabis sativa recommended as a green manure as it has many other uses like fibre: – paper, fabric, building material? the seeds are high in omega fatty acids and digestible proteins. Oil:- biodegradable plastics, paints, MNE varnishes soaps, lamp oil, animal feed or bedding……What are the additional nutrient requirements in order to grow these crops without sacrificing the soil health aspects when the crops are partially or even totally removed?	C	A project (08RE07: Critical evaluation of a sugarcane-soybean crop rotation system in the South African sugar industry) is currently underway, examining the general benefits and challenges of using a crop rotation (as opposed to a straight green manure/cover crop) with sugarcane. Soybeans were chosen as the study crop. Unfortunately, although SASRI strongly acknowledges the importance of crop rotation and its benefits in terms of soil health, SASRI has not been given the mandate to study cash crops other than sugarcane. Cedara/Department of Agriculture is a good source of information on alternative crops. Rob Osborne (Head of Horticulture) 033 3558140 or Vlatko Katusic (extension officer and an experienced vegetable grower) 031 3022848 can be contacted for advice on cash crops other than sugarcane. SASRI can be contacted for advice on correct fertiliser management for sugarcane grown after such crops.
Cane-Cutter Nutritional & Hydration requirements: What is the best diet for staff harvesting cane in order to enhance higher productivity?	C	The nutrition department of the South African Sugar Association has published recommendations for nutritional supplementation for cane cutters. These recommendations have been published in the South African Canegrowers Association newsletter "The Canegrower", September 2007, Volume 14, Number 6, Page 2. More information on canecutter nutrition can be obtained from the SASA Nutrition department: The South African Sugar Association Nutrition Department - External Affairs 170 Flanders Drive, Mount Edgecombe, 4300 Tel : 031 508 7036 Fax : 031 508 7191 Email : nutrition@sasa.org.za

Recycling the old soil sample bags vs. the new boxes: It's felt that the recycling of the old soil sample bags reduced the carbon foot print and therefore more of an issue than the extra soil deposited at FAS.	C	The choice to change from soil sampling bags to boxes was based on a number of factors, including ease of use, smaller volumes of soil collected, ease of transport and storage. It is of note that the boxes are composed of a biodegradable material. The efficiencies that the new sample boxes bring to the FAS operation off-sets their perceived carbon footprint.
Recycling on farm waste products: e.g. Is there a market and process to collect and recycle old chemical containers?	C	In South Africa, incineration of empty plastic or other combustible agrochemical containers is illegal. Instead, these containers should be triple-rinsed, and the rinse water poured into the spray tank. Holes should be punched in the base of the empty containers, or the containers cut up or flattened so that they cannot be used for other purposes. The containers must then be sent to a registered hazardous waste disposal site, or may be sent for recycling to a registered recycler. If the empty containers treated in this manner cannot be immediately sent for disposal or recycling, they must be stored in such a way that they do not pollute the environment. Other types of empty containers such as metal drums which cannot be recycled must be sent to a registered hazardous waste disposal site, or be returned to the suppliers. This latter practice is especially important in remote areas where companies that handle hazardous waste do not offer a service. Obsolete or unwanted chemical formulations must also be disposed of at a registered hazardous waste site. (Taken from an article in The Link, Vol 21, No. 2, May 2012, pg 18-19).
UCL: MIDLANDS REGION		
Weedicides: Cynodon and Ntitimbili control / Management methods for improved control.	B	One herbicide has been registered for control, which will be launched later in 2012. One of the outcomes of a current SASRI project (06CP15) is an Integrated Pest Management manual for creeping grasses. In addition, new chemicals are being screened in a long term project that searches for new herbicides (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control).
Crop protection – Fungicides: Effectiveness/cost comparison of existing products used for the control of rust.	B	Abacus® is currently the only product registered for the management of brown rust on sugarcane. Amistar Top® was tested in the same trials as Abacus® and was not as effective in reducing disease severity and improving yields. A new product with the same active ingredients as Abacus® is being tested by Syngenta but since the product has not as yet been registered for use on sugarcane, it cannot be recommended. Canegrowers are investigating the economics of applying the registered fungicide (Abacus®) for brown rust management. If new products are found to be effective against the disease and are likely to be registered, they will be included in the assessment.
Variety selection: Midlands Varieties for low potential sites.	C	Variety characterisation under Midlands conditions is ongoing within the SADRI Variety Evaluation Project (00VI02) under the leadership of Sanesh Ramburan. In the Midlands, varieties are evaluated on sandy soils that have less than 10% clay in an area that receives less than the average rainfall for the district. Included here areas around Mount Ellias, between Wartburg and Dalton, Wartburg to New Hanover. In the Eston area, a number of farms with this type of situation between Stoney Ridge and Eston. SASRI is seeking to develop a variety similar or better than N31 with higher RV for these conditions.

Nematicides: Replacement for Temik.	A	The January 2011 LINK article “Nematicides for sugarcane in South Africa” describes the cost and profits associated with the most commonly used nematicides in the South African sugarcane industry. With regards to their safety, Curaterr and the Vydate GR formulation are yellow label products and are therefore safer than Temik. Cropguard and the Vydate SL formulation are red label products and are therefore as toxic as Temik. In general, liquid formulations of nematicides are red label products and more toxic than the granular forms. Research is currently focusing on finding a replacement for Temik. A long term project on alternative chemistries was initiated in April 2012 (00CP04: Additional chemistries and strategies for sugarcane pest, nematode, disease and weed control). The article: “More nematicide trials. Looking for a replacement for Temik” in the May 2012 edition of the LINK provides information on the current trials focusing on a replacement for Temik
Varieties: Susceptibility of new varieties to nematodes.	B	All released varieties are routinely screened for their susceptibility to nematodes, a process that forms an ongoing SASRI Project (00CP01: Variety Evaluation - Nematodes Project). Upon release to the industry, new varieties enter the variety evaluation project where resistance ratings are assigned. However, it should be noted that the accurate determination of variety responses to nematodes requires large data-sets that are collected over a number of years.
Nutrition: Improvements in nutrition/fertiliser recommendations.	B	• SASRI does not have the capacity to test the many products that come onto the market each year. • Research, both locally and overseas, indicates that ‘wonder’ products are invariably of little or no value in terms of improving soil health and crop yields. Growers are therefore cautioned to steer clear of untested products. • In any event, the purveyor of a product should be required to demonstrate its effect by first applying it to a strip of sugarcane, before it is used on the crop as a whole.
Nutrition: Use of plant growth promoting rhizobacteria as a partial substitute for inorganic nitrogen.	C	• SASRI does not have the capacity to test the many products that come onto the market each year. • Research, both locally and overseas, indicates that ‘wonder’ products are invariably of little or no value in terms of improving soil health and crop yields. Growers are therefore cautioned to steer clear of untested products. • In any event, the purveyor of a product should be required to demonstrate its effect by first applying it to a strip of sugarcane, before it is used on the crop as a whole.
Nutrition: Addition of Calcium Sulphate in CMS as a soil ameliorant. Does it work ? How do we use it ? (Scorching of leaves has been noticed – timing of application)	B	Growers need to be aware that indiscriminate mixing of products invariably results in problems. In the case of CMS, this product has limited capacity to solubilize other chemicals; this means that segregation in the CMS tank is likely to be a problem, while large concentrations of solids may be deposited on crop leaves. It is the responsibility of the CMS suppliers to ensure the efficacy and safety of their products (SASRI does not have the capacity to test the many CMS formulations being promoted in the industry).
Compaction: Different effects of soil type and slope on soil compaction.	C	The most important soil factors to be taken into account when considering compaction are soil water content, organic matter content, clay content (texture) and type of clay. Slope has little to do with compaction other than to restrict vehicle movement where the slope is too steep. The slope threshold will also change depending on the water content at the time. It is likely that stool damage, rather than compaction per se, is at issue here. If this is the case, Growers should consider the introduction of systems to support controlled traffic. Nevertheless, slope will be a factor when deciding whether a vehicle should enter a field or not. Maps produced by the SASRI GIS Specialist, Ingrid Mthembu, will provide guidance on which fields can be mechanised and thus where compaction (stool damage) problems are to be expected. This information should be overlaid with texture and organic matter maps if they are available.