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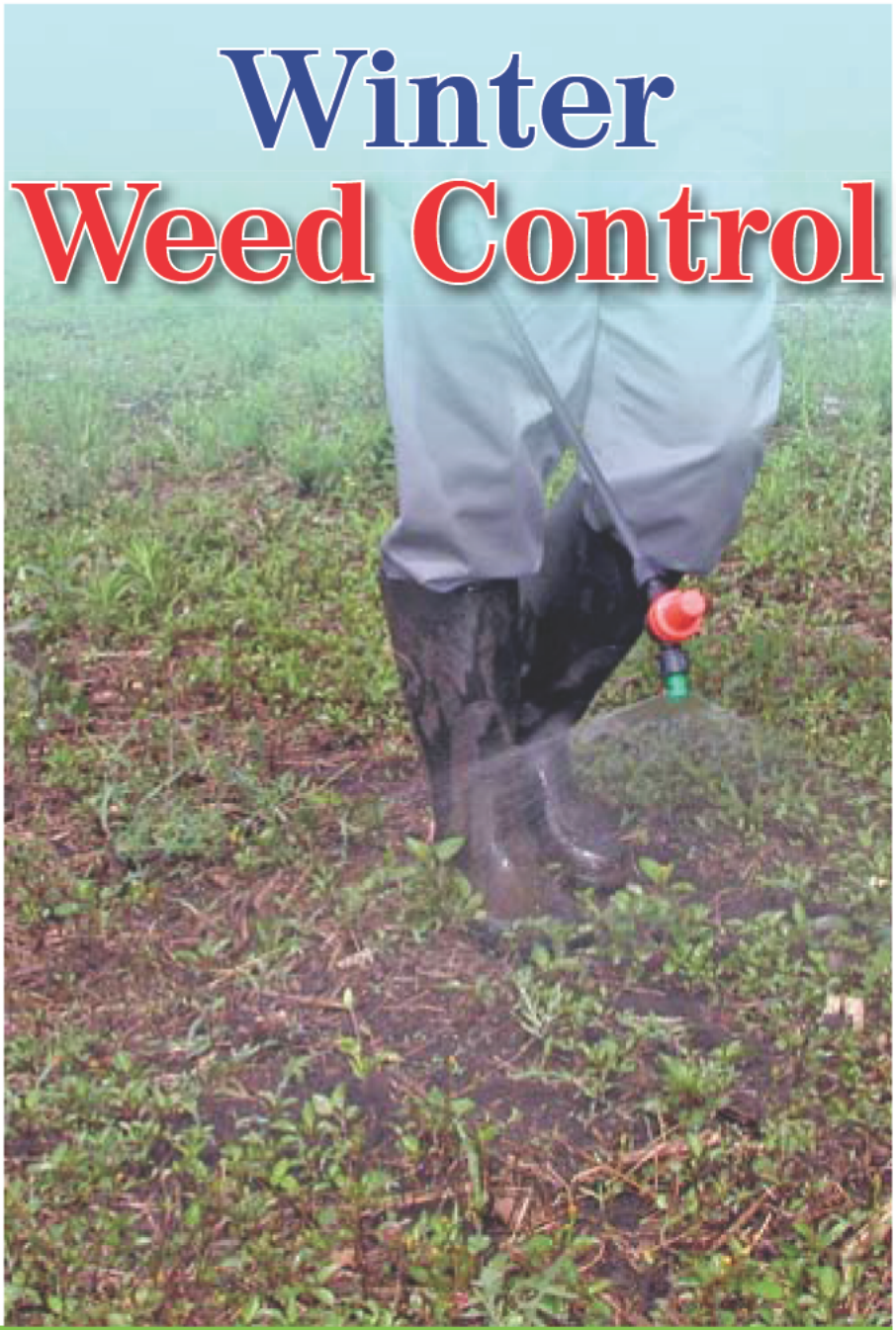
Winter Weed Control



Page 14: Guidelines for winter herbicide application to control grass seedlings, creeping grasses, broadleaf seedlings and escaped weeds for overall farm weed control.

Page 12: Important factors to consider when identifying fields for carry-over cane.

Page 16: More advice on how to correct soil acidity problems by using lime and gypsum.

Page 18: An update on the legislation governing responsible disposal of hazardous chemicals.

SASRI
Unlocking the potential of sugarcane

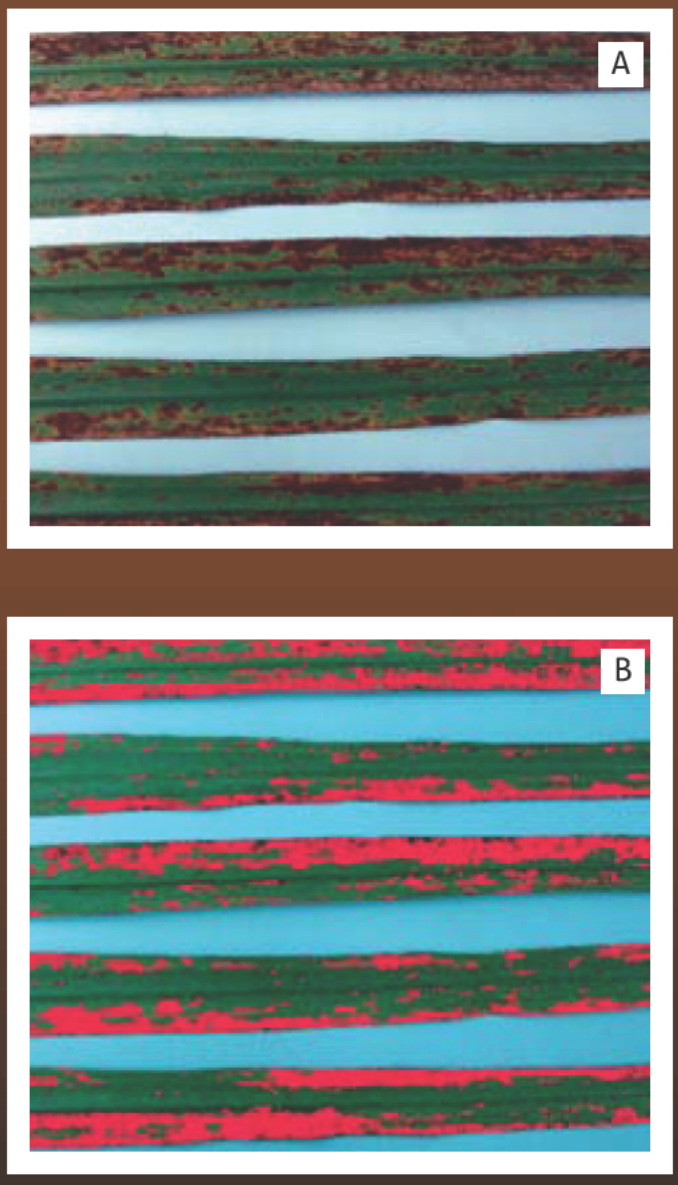
Assessing Brown Rust Infection

Aimee Koch
(Assistant Research Officer: Plant Pathology)

In order to assist with disease quantification and susceptibility studies, SASRI has invested in image analysis software developed by the American Phytopathological Society. This software has allowed SASRI to accurately and objectively quantify the severity of rust infections on sugarcane leaves.

The software works by analysing photographs of the sugarcane leaves. Firstly the total area of each leaf is identified and quantified, followed by the identification and quantification of the area covered by leaf lesions. This results in tabulated data outputs of percentage lesions per leaf. This accurate quantification of rust severity is being used to measure differences in fungicide treatments for product registration purposes, and also to assess varietal susceptibility to brown rust.

This software is not only applicable to assessing disease severity, but is also being used at SASRI for the quantification of root length as well as thrips damage.



Rust-infected sugarcane leaves (A) are analysed by software which highlights the areas of infection (B) and then expresses this as a percentage of the total leaf area .

Message from the DIRECTOR

Dr Carolyn Baker

The last land utilisation survey shows that 13.5% of South Africa's land is devoted to commercial agriculture. It is no surprise therefore that the area under cane in KwaZulu-Natal and Mpumalanga represents a much smaller proportion of this total (only 2.75%). Small in the grand scheme of things – and yet significant in that it is only this land that we influence and control, and hence for which we can be held accountable. Consequently, the practices that we recommend to growers are not insensitive to this responsibility and include a suite of conservation and good stewardship practices, including soil conservation, the prudent use of agrochemicals and optimal utilisation of natural resources such as irrigation water, to name a few.

In this edition of the Link we focus on some topical agrochemical issues and demonstrate the work that we are doing to identify a suitable replacement for Temik. It is without doubt that nematodes cost the industry dearly, and their management is one of the pre-requisites for improving yields. Because we advocate a considered approach to the use of agrochemicals, much of our research into the control of pests and diseases entails a broad 'integrated' approach in which we recommend the use of alternative methods for control. The article on biopesticides reflects one of these alternatives and demonstrates some of the work into the potential use of selected fungi as a biocontrol agent for white grubs. Nevertheless, agrochemicals are widely used in the industry and one of the consequences of this is the proliferation of empty chemical containers following use, and ensuring their safe disposal rests heavily on growers' shoulders. While safe disposal mechanisms and sites are the responsibility of the chemical companies, it is the management of those empty containers while on-farm that is of concern. For this reason, explicit guidelines on the responsible handling of empty containers on-farm are the subject of another article.

Recognising the value of agrochemicals as a means to assist in pest and disease control is important, and yet understanding that agrochemicals are just one of the tools in the pest and disease management toolbox, is what makes their use particularly valuable. Overuse of any chemical is problematic and it is invariably used as a last resort.

TOPICAL

Land Use Planning

- Winter is a good time to establish grassed waterways. This is best done the year before a field is to be replanted. Use a fire tanker to water the newly planted grass until it is established. Remember to place revetts made of bundles of cane tops across new waterways to limit soil loss in the event of a storm.
- This is also a good time of year to begin and complete the construction of new field layouts.
- Soil conservation structures and waterways will work only if properly maintained. Check these structures during this dry period so that you can face the coming rainy season with confidence.
- It is also the time to maintain drains on your farm. Remember, this is permissible by hand only. Regular maintenance will prevent a build-up of sediment and prevent further drainage problems from developing.

Land Preparation and Replant

- Check fields for regrowth where cane was killed using glyphosate in summer, in preparation for planting in winter or spring. Glyphosate seldom gives a 100 percent kill, and you may need to return at least twice to remove regrowth.
- You need to plan your seedcane requirements far in advance, start looking at your replant programme for two years hence. This will enable the seedcane to grow and be planted into a farm nursery and from there, into commercial fields the following year.
- Start spring planting if early rains are received – ensure you ¸lant with a fun¸icide to ¸revent ¸inea¸ ¸le disease.

TIPS

May - August 2012

Nutrition

- Soil sample fields as soon as possible after harvest in order to plan your liming and fertiliser programme. In plant fields, take samples of both the topsoil AND subsoil layers 0-200; 200-400 and 400-600 mm in order to determine if subsoil acidity problems exist.
- Starting the application of fertiliser too early could result in unnecessary losses of nitrogen on certain soils. FAS samples will identify those at greatest risk.
- Begin fertiliser application on the coast in August, if conditions are suitable.
- Plan for split applications of nitrogen fertiliser on soils that are either very sandy or poorly drained.

Irrigation

- Winter is the best time to maintain and repair irrigation equipment. Simple checks include taking measurements of the following: operating pressures, nozzle wear and emitter flow-rates. The South African Irrigation Institute (SABI) offers training courses for growers and managers which are aimed at ensuring the irrigation system hardware is performing according to design specifications and accepted standards. Speak to your local Extension Specialist to arrange these courses.
- Schedule irrigation for cooler months.

Harvesting

- Abide by the local burning code of practice.
- It is important to harvest those fields with the highest level of eldana damage first in order to prevent further losses. Do your own surveys if necessary.
- In the Midlands look out for signs of early frost damage during May and continue to monitor the low lying areas throughout the winter period.
- Ensure the best RV yields are obtained by harvesting cane that is mature, clean, and fresh.
- At harvest, don't neglect the basics. Poor base cutting and topping on many farms is robbing growers of valuable income. For example, a ten centimeter length of stick left undelivered over a hectare equates to five tons of cane. Topping too high and including stick that has zero Recoverable /alue is simply incurring transport costs for no return as well as reducing the RV% for that consignment by including more non-sucrose.
- Varieties can be loosely classified as either early, mid or late season varieties, being an indication of the time of the season when they have the greatest advantage in sucrose/RV yield. In some cases, harvesting at the right time can result in as much as a 20% improvement when compared with yields of standard varieties. In regions where farms are harvested on a 12 month cycle, it therefore makes good economic sense to exploit this by planting a range of varieties, provided soils and growing conditions are suitable.

Pests and Diseases

- Begin to identify and survey potential carryover fields that could benefit from applications of FASTAC to control eldana. Consult with your local LPD&VCC Officer .
- Start FASTAC applications to control eldana in carryover cane in August.
- Continue surveying potential carryover cane for eldana infestation (prior to guaranteed estimate).
- Remember to take RSD samples in all fields to be re-established this year – before they are harvested. If found to be positive for RSD, fields need to be fallowed for at least six months.
- Don't forget to sample seedcane nurseries for RSD.
- Start roguing fields of smut-susceptible varieties.

Management

- Clear firebreaks.
- Control your winter weeds.
- This is a good time to service and calibrate fertiliser and herbicide applicators.

SASRI Extension Team

Calculating the impacts of Climate Change

SASRI has a strategic responsibility to determine, as best possible, the composition and severity of future climate impacts, in order to develop appropriate adaptation strategies for the long-term profitability and sustainability of the sugar industry. These issues are the focus of a recently-started project at SASRI.

Sugarcane simulation models, for example the SASRI Canegro model, can estimate yield and water use (and many other variables that affect these), given certain weather and soil information. Although these models are our primary tools for climate impact studies, model-based estimates of future sugarcane yields and production are only as good as the predictions of future climatic conditions on which the crop simulations are based.

Climate simulation models ("Global Climate Models", GCMs) are used to predict future weather, but much uncertainty surrounds these predictions. A way to address this uncertainty is to use the 'ensemble approach', in which many (20-30) different GCMs are run to produce a set of projections for future weather, for a particular industrialisation (emissions) scenario. A similar ensemble of crop simulation models is then run on these projected weather datasets, to produce distributions of expected yields. Where models generally correspond – both on the nature and extent of climate changes (climate models), and the impacts of these on sugarcane crop production (crop models) – the outcomes will be considered more certain and credible; and therefore more likely.

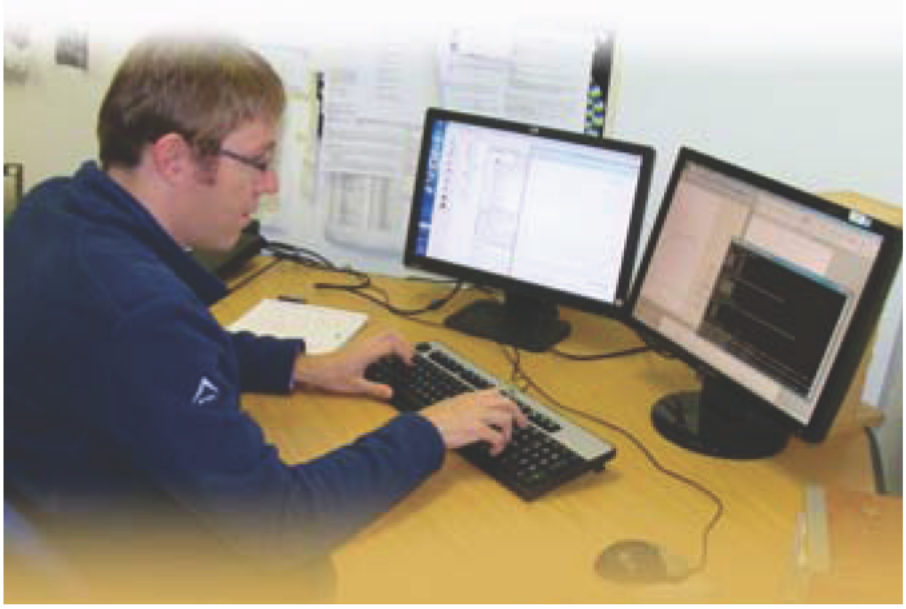
SASRI scientists will use the ensemble approach to explore several facets of climate change impacts, including:

- Yields (in different parts of the industry) and season-to-season variability thereof.
- The identification of sugarcane field management strategies that might increase yields and profitability, and reduce risk (such as increased air temperatures allowing for shorter cutting cycles and wider row-spacing).
- Changes to the viability of land currently suitable or unsuitable for sugarcane cultivation.
- The identification of basic genotype traits that might improve the suitability of SASRI sugarcane varieties for future environments.

These investigations will greatly enhance our understanding of climate change impacts, from a sub-plant scale right up to industry production level.

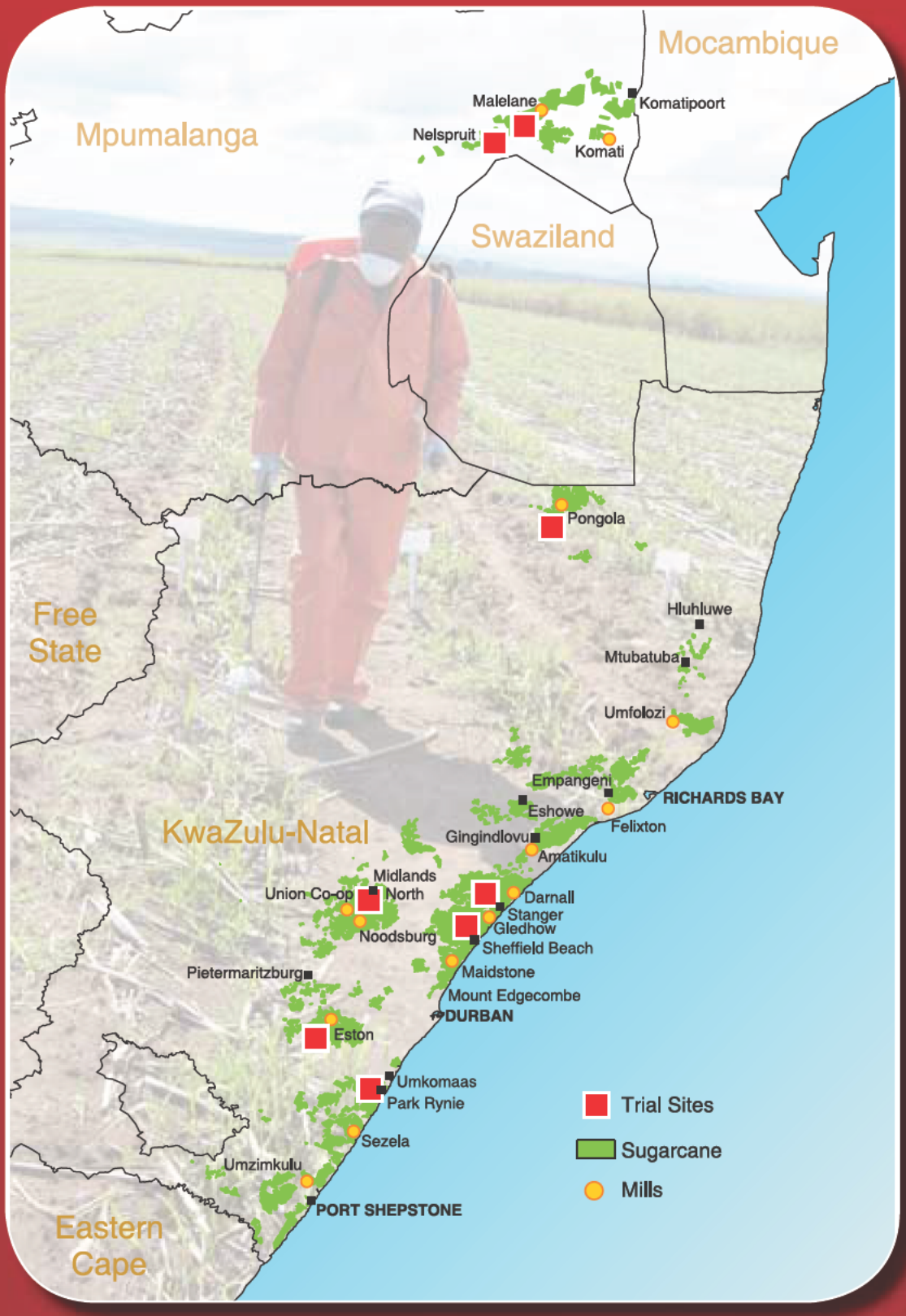
The protocols developed for AgMIP (Agricultural Model Intercomparison and Improvement Project, www.agmip.org) will be followed in this project. AgMIP aims to characterise the impacts of climate change on global food production and prices, and the outcomes of the project are to be included in the International Panel for Climate Change (IPCC) Assessment Report 5. SASRI's participation in this prestigious international project includes the improvement of the DSSAT Canegro sugarcane model for climate change impacts, and sugarcane simulation studies for South and southern Africa.

Matthew Jones
(Scientific Programmer)



More nematicide trials

Looking for a Replacement for Temik



For many years Temik has been the most commonly-used nematicide in the South African sugar industry. Its sudden withdrawal from the market early in 2011 left growers with much to think about. To address this problem, SASRI is currently screening many new chemical and biological control products in pot and field trials with the aim of finding a number of suitable replacement nematicides within the next two years. These trials aim to find a replacement that is readily available in South Africa, is more environmentally friendly than Temik was, increases yields and is economically viable.

In addition to these trials, a second set of trials has been established to collect more information on the performance of other nematicides which are currently registered on sugarcane. These nematicides include CropGuard, Curaterr and Vydate. The January 2011 edition of The Link summarised the costs and profits associated with each of these chemicals. To update this information, more trial data will be collected in the form of eight nematicide screening trials which were planted throughout the sugar industry at the end of 2011 (see map). These trials were laid out in early ratoon fields on sandy soils (<10% clay).

In each of these trials, CropGuard, Curaterr, Vydate liquid and granules were applied over the ratoon crop within four weeks of harvesting. Sugarcane growth measurements (stalk heights and counts) are being conducted every three months.

The coastal and irrigated trials will be harvested in October - December 2012 and the two inland trials will be harvested in October 2013.

Data collected from these trials will greatly improve our estimations on profits and losses from these nematicides and assist in designing appropriate recommendations for sugarcane growers. This will be presented in the January 2013 edition of The LINK.

Shaun Berry *(former SASRI Scientist: Nematology)* **&**
Prabashnie Ramouthar *(Assistant Research Officer)*

Controlling White Grubs using indigenous fungi

Tarryn Goble
(PhD Student, Crop Biology Resource Unit)

Photo credits: Mike Way and Tarryn Goble

Work previously done at SASRI has shown that fungal outbreaks caused the deaths of many white grubs on a sugarcane farm in the Midlands North region. These outbreaks of fungus are nature's way of controlling insect pest populations which have reached high densities. In 2010, two more farms in the Dalton area were also found to harbour these fungal outbreaks. We needed to find out which species of fungus were causing the death of white grubs, and which white grub species were being infected.

Using molecular techniques, the fungal species responsible for killing white grubs was identified as *Beauveria brongniartii*. The fungus seemed to be especially associated with two common white grub species occurring in the midlands north area, *Hypopholis sommeri* and *Schizonycha affinis*. This fungal species has been responsible for spectacular outbreaks in Europe on the cockchafer beetle, *Melolontha melolontha*. The success of the fungus has seen it being produced for pest control by several European companies. These products have successfully controlled European cockchafer beetle in perennial crops since 1991.

Current research has identified a number of promising fungal strains of the same fungal species, which may aid in the biological control of white grubs in sugarcane. Plans for the future are to begin field trials in sugarcane by 2013. Should these be successful, then mass-production and formulation of the promising fungal strains will be undertaken to produce biological insecticides.

Tracking white grub movement

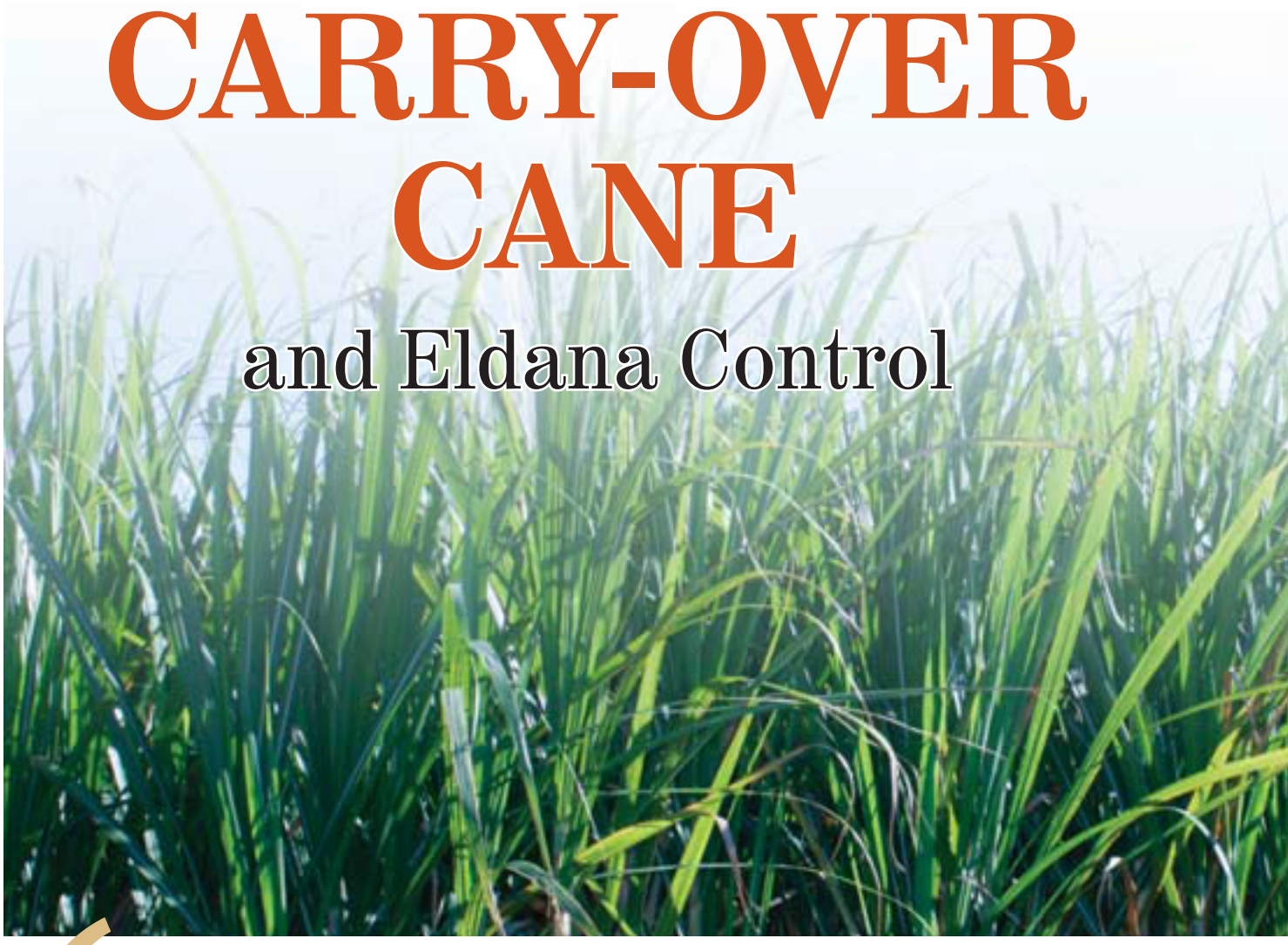
The spread of the fungus in midlands north seems to be related to the life cycle of white grubs. In late October until the end of November, mass emergences of white grub beetles have been observed. Adult beetles emerge from sugarcane fields and fly to black wattle stands where they feed and mate in the trees. Once mating has taken place, the females fly into sugarcane fields and deposit eggs into the soil. It is the ability of these beetle species to utilise both sugarcane and black wattle as a food source which has seen white grubs becoming more of a pest in the midlands north area, where many growers cultivate both sugarcane and black wattle in adjacent stands on the same farm.

Molecular research has shown that the fungus, *B. brongniartii*, is cycled above and below ground by white grubs. Since *B. brongniartii* is a soil-borne fungus, white grub larvae come into contact with fungal spores in the soil. Adults then also come into contact with fungal spores when they emerge after pupation from soils harbouring the fungus. Adult death only occurs 3-5 days after a beetle has become infected with the fungus. This means that beetles have already flown to their respective black wattle feeding (and mating) trees during this time and are able to infect other feeding and mating beetles when they die on the branches and spread the fungal spores. Healthy adult beetles can also pick these fungal spores up from black wattle leaf surfaces and become infected.

Adult beetle in black wattle.

CARRY-OVER CANE

and Eldana Control



> The extent of eldana damage in April can be between two and three times that of the damage assessed in the previous August in carry-over cane. There is an estimated 1 to 1.5% loss in RV% for every 1% stalk length red. For example, on average, a field with 4% stalk length red in August, equating to a 6% loss in RV%, could result in an 18% loss in the RV% if the field is carried over to April.

It is now time for you to identify fields for carrying over. It is important to have some carry-over cane with which to start the season, but it is equally important that eldana levels in such cane are low. Summer is a time when eldana numbers can grow rapidly and, under suitable conditions, can negate the economic value of carrying over a crop. Studies have shown that eldana damage in April is typically three times that of the previous August carry-over cane.

So, what can be done to minimise eldana in your carry-over cane? The following points need to be taken into account when considering which fields to carryover:

- Check the resistance category of the variety. This will give you a guide to the likely risk of eldana damage (see Table).
- Eldana infestations are known to increase enormously when the cane is stressed. Low rainfall in conjunction with shallow soils, high levels of available N and susceptible varieties will result in runaway infestations in carry-over cane. Assess each field according to these criteria.
- The current and historical levels of eldana in the field are most important. You must know your levels from P&D sur-

once every two weeks over the period August to November. The product can be effectively applied by air or ground. With aerial application, precautions against possible drift need to be considered. Remember however, that Fastac® will not eliminate eldana, but will suppress populations thereby reducing the risk of runaway infestations.

By considering these guidelines where eldana is a problem, you will be better able to manage the threat that this pest poses to your farming operations. Please contact your local Extension Specialist regarding variety suitability and possible Pest and Disease restrictions regarding carry over cane.

Varieties and eldana risk.

VARIETY	ELDANA RISK CATEGORY
N12, N21, N29, N33, N39, N41, N42, N53	LOW RISK of economically damaging infestations, provided cane is not stressed. May be aged or carried over.
N14, N16, N17, N18, N19, N22, N23, N24, N25, N27, N28, N31, N32, N35, N36, N37, N40, NCo376, N43, N45, N46, N47, N48, N49, N50, N51, N52	MODERATE RISK of economically damaging infestations, provided cane is not stressed. May be aged slightly, but carry-over with caution. Carry-over in the coastal region is not recommended.
N26, N30	HIGH RISK of economically damaging infestations. Do not carry-over.

veys, as well as from your own surveys and make decisions accordingly. Adhere to eldana threshold levels set by your LPD&VC Committees.

- Consider using Fastac® to reduce the impact of eldana on carry-over cane. The greatest benefit can be in situations where there is a good likelihood of severe eldana infestation developing. Currently, our recommendation is that Fastac® be applied eight times at a rate of 200 ml product in 350 litres of water per hectare

Graeme Leslie
(Principal Entomologist)

Winter Weed Control

Overall farm weed control is a necessary practice, even as we enter winter. Here are some guidelines for winter herbicide application.

Grass seedlings

Grass seedlings are generally not prominent when temperatures are too cold for germination. However, in the event of a relatively warm winter, certain grass species, for example uBabe grass (*Panicum maximum*) can germinate and these will require treatment (refer to Tables 4 - 6 in the SASRI Herbicide Guide 2011).

Creeping grasses

With warmer temperatures on the coast, creeping grasses may need the appropriate treatment during August to ensure the grass does not spread rapidly. Spot spray using glyphosate with a shield, or in larger infestations, paraquat + diuron in short cane. In cooler regions, first treatment would usually occur later on.

Broadleaf seedlings

If there are winter rains, expect a flush of broadleaf seedlings. Treat broadleaf seedlings when they are small (less than 10 cm), with MCPA plus ametryn. Voloxytril® can be added when better knockdown is required on slightly larger weeds. In the event of heavy rains, resulting in a moist soil, diuron could be added to MCPA instead of ametryn (Refer to Table 6 in the SASRI Herbicide Guide).

Escaped weeds
(i.e. weeds that survive a herbicide treatment)

When there are low densities of escaped broadleaf weeds and tillered grasses such as *Panicum maximum*, spot spraying with a knockdown control product can be carried out, for example, paraquat plus diuron. It must be noted that MSMA is not commonly used in winter. An alternative option is hand-weeding but this is expensive; chemical control is usually more cost-effective (Refer to Table 7 in the SASRI Herbicide Guide).

Clean (weed-free) fields

Where there are clean fields, consider spraying in winter with a pre-emergence application, selecting products according to growth of cane and soil moisture conditions. Options for ratoon fields include hexazinone + diuron, Merlin® + diuron, Merlin® + ametryn or Merlin® + Velpar®. **Note: Growers need to take into consideration the phytotoxicity risks of both Merlin® and Velpar®/ hexazinone. Only apply these products under the soil and crop growth conditions specified on the product labels.** In plant cane and ratoon fields, pre-early post-emergence application MCPA + ametryn or MCPA + diuron will provide short-term control of weeds emerging after winter rains.

The application of either a short or long-term herbicide treatment will be effective against weeds in winter and will 'buy' time for when weed pressure really begins in Spring/early Summer.

Peta Campbell
(Senior Agronomist: Weed Control)

Management of SOIL ACIDITY

Soil acidity – the nature of the problem

Fertiliser Advisory Service (FAS) data indicate that, in general, there has been marked acidification of soils in the rainfed areas of the sugar industry during the past few decades. This has not yet been accompanied by massive yield decreases due largely to the remarkable tolerance of sugarcane to acid soil conditions. However, production on severely acidic soils will eventually result in declining yields. Reasons for this include the following:

Under acid conditions, the *aluminium and manganese* contained in clay particles become more soluble, making them toxic to plant roots and therefore limiting root growth. This may drastically reduce yields through the restriction of water and nutrient uptake.

Levels of *calcium (Ca) and magnesium (Mg)* in acid soils are often very low, and may pose a limitation to plant growth. In rainfed sugarcane in KwaZulu-Natal, high concentrations of aluminium and limiting concentrations of Ca *in subsoils* in particular are widespread phenomena. These conditions restrict root development in subsoils and render crops more susceptible to drought and nutritional stresses.

Acid soil conditions impact negatively on *soil biological activity*. Evidence of this is the slow break-down of surface-applied organic matter (e.g. trash) on acid soils. Furthermore, most beneficial earthworm species are sensitive to soil acidity.

Functions of lime and gypsum

Soil acidity problems are corrected by the use of lime and gypsum. Lime (both dolomitic and calcitic) and gypsum are, however, chemically very different products, and consequently their effects on soil properties are quite dissimilar (Table 1).

Table 1. Differences between lime and gypsum in terms of their effects on soil pH, the nutrients contained in them, and their mobility in the soil.

	Lime	Gypsum
Increases pH	Yes	No
Supplies Ca	Yes	Yes
Supplies Mg	Yes	No
Supplies S	No	Yes
Mobile in soil (i.e. movement into subsoil)	No	Yes

Lime is the ideal product for correcting soil acidity, since it supplies Ca and Mg, and also increases soil pH. With increasing pH, aluminium and manganese toxicities in the soil are eliminated. However, lime is generally not very effective for the correction of subsoil acidity, since in soils with more than about 15% clay, lime incorporated into the topsoil is not mobile, and thus has little or no impact on subsoil acidity. Furthermore, incorporation of lime into subsoils by deep ploughing or other mechanical means has been found to be impractical and uneconomic. Thus lime incorporated into the topsoil to a depth of 20 to 30 cm effectively counteracts acidity in this zone; however, it has little effect on acidity below the zone of incorporation.

Gypsum, on the other hand, is more mobile in the soil than lime, and with time and rainfall it moves into subsoils where it reduces the toxic effects of aluminium and supplies much-needed calcium for healthy root growth. Gypsum is also a valuable sulphur fertiliser; the crop requires about as much sulphur as phosphorus!

SASRI scientists are confident that more stringent management of soil acidity implies numerous benefits, including increased profits and improved soil health.

FAS RECOMMENDATIONS FOR LIME AND GYPSUM

Overriding considerations in developing lime and gypsum recommendations for the new FAS package, launched in August 2011, included the following:

1. Crop yields must be optimised. A re-examination of long-term field trial data from SASRI's research database showed that yield declines in later ratoons were due to acidity build-up during cropping cycles. This implies a need for higher lime applications (based on FAS recommendations) at planting in order to promote crop longevity.

2. During the past few years, evidence has emerged of widespread acidity and calcium deficiency problems in subsoils. These conditions give rise to shallow-rooted crops which are highly susceptible to moisture stress. International research has conclusively shown that the use of gypsum is the most cost-effective means of managing subsoil acidity. Furthermore, in areas such as Eshowe/Entumeni and the Midlands, numerous growers have noted significant improvements to their crops following gypsum applications. With these considerations in mind, the new FAS package now provides recommendations for the use of gypsum; these are based on subsoil samples.

Neil Miles *(Senior Soil Scientist)*

Management of Agricultural Chemical Containers and Packaging:

What the Law requires

The National Environmental Management: Waste Act (Act No. 59 of 2008), and the Draft Waste Classification and Management Regulations (due to be implemented this year) are very clear on the management and disposal of hazardous waste. According to this legislation, all containers and packaging which have been in contact with hazardous chemicals (including agricultural chemicals) are considered hazardous waste, and must be treated as such. This legislation places significant responsibility on the grower to manage the empty containers and packaging appropriately.

Responsible disposal of agrochemical containers

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.

Other provisions of the Waste Act

The Waste Act allows for the development of Industry Waste Management Plans (IndWMPs). An IndWMP is essentially a working document produced by a particular industry which demonstrates how the waste they produce will be managed. This is an approach to self-regulation, and can be a proactive step by an industry to ensure that they are compliant with the provisions of the Waste Act, and that the responsible authorities are in agreement with their management practices.

The Waste Act also makes provision for extended producer responsibility (EPR). EPR is a system that can be put in place by a producer to extend their financial and/or physical responsibility for a product (or the resultant waste) to the post-consumer stage. For example, the manufacturer would be responsible for the recycling, treatment or disposal of the chemical containers. Such a system could attract a levy on the purchase of products in order to fund the waste management, but that would depend on how the system is designed and implemented.

The Association of Veterinary and Crop Associations of South Africa (AVCASA) represents companies involved in the crop protection and animal health products industry in South Africa. They have indicated that they are working on various environmentally sound container management strategies as part of their waste management plan submitted to the Department of Environmental Affairs. To this end, they are working closely with reputable service providers who comply with the applicable South African legislation regarding waste management. For more information please visit www.avcasa.co.za.

Marilyn Govender
(Natural Resource Manager: South African Sugar Association) &
Co-authored by
Heather Sheard
(Deputy Manager: Waste and Chemicals Management - Department of Agriculture, Environmental Affairs and Rural Development, KwaZulu-Natal)

WEATHER

Review

November and December 2011 rainfall was above average for most regions of the South African sugar industry except for Mpumalanga where November rainfall was well below average. January and February rainfall was well below average for all KZN regions (Fig. 1) and affected the growth of rainfed crops negatively. Mpumalanga, however recorded well above average rainfall in January as a result of tropical storm Dando, which caused flooding in some parts of the province after receiving rainfall of up to 450 mm between 16 and 18 January 2012. March 2012 rainfall was generally well above average for most KZN areas where tropical storm Irina resulted in heavy rainfall in the coastal areas.

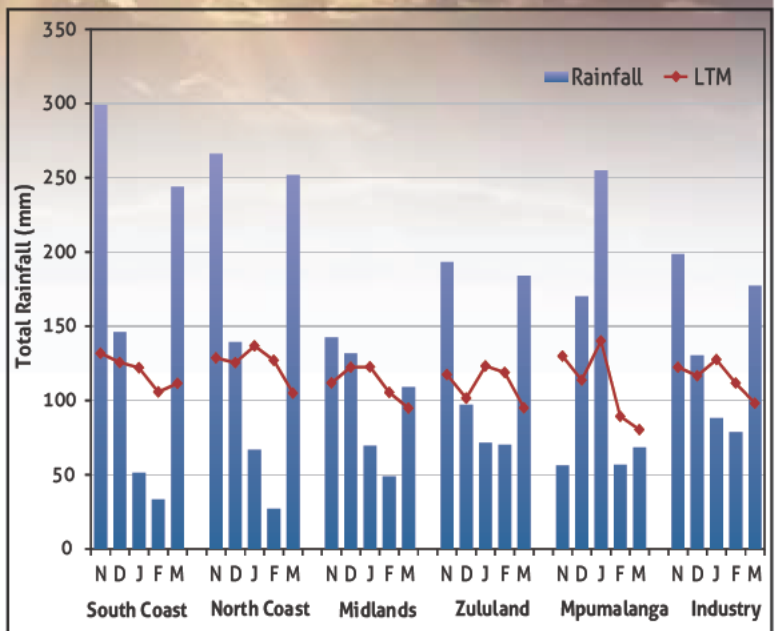
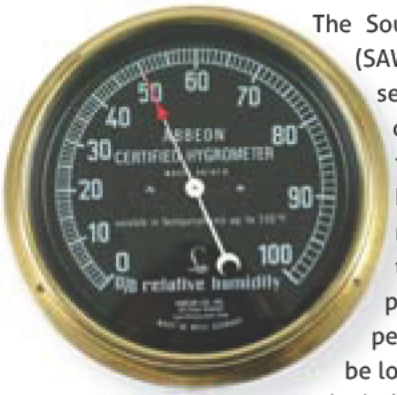


Figure 1. Regional and industry monthly total rainfall and the monthly long-term means (LTM) for November 2011 to March 2012.

Outlook

The cold ENSO conditions (La Niña) that existed during summer are likely to return to the neutral phase during the 2012 winter. There is a possibility of warm ENSO conditions (El Niño) developing towards the end of 2012 although a more certain forecast will only become available in mid-winter. El Niño conditions are normally associated with below normal summer rainfall in sugarcane producing areas in South Africa.



The South African Weather Service (SAWS), the International Research Institute for Climate Society and the European Center for Medium-Range Weather Forecasts all expect near normal winter rainfall to occur in the industry. There is a strong possibility that minimum temperatures in mid-winter could be lower than normal over most of the industry.

Please visit the SASRI weather web *http://portal.sasa.org.za/weatherweb/* for links to updated seasonal weather forecasts and also for the latest rainfall and other weather data.

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