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In this issue...

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SUBSOIL ACIDITY

The Unseen Enemy

Soil samples taken below the plough layer reveal that severe subsoil acidity is a widespread problem in the rainfed areas, and not surprisingly, in many of the soils sampled, little or no evidence of rooting was apparent at depths of greater than 30 to 40 cm (Figure 1).

Decreased yields of crops growing on soils with subsoil acidity are due largely to two factors:

Firstly, a major consequence of subsoil acidity in terms of crop growth is an increased susceptibility to drought stress. A lack of roots in the subsoil means that once topsoil water reserves are diminished, the crop is unable to access water in the subsoil. The massive differences in available water for deep-rooted and shallow-rooted crops in a sandy loam soil are illustrated in Figure 2.

Secondly, excessive subsoil acidity reduces the ability of the crop to access nutrient reserves in the subsoil. In particular, nitrates, calcium, magnesium and potassium.

Continued on page 2

Figure 1. Poor root growth (2nd ratoon) into an acid subsoil where the crop was planted with only 1 t/ha lime.

Continued from page 1

Causes of subsoil acidity

Many soils have naturally acid subsoils as a result of weathering processes over geological time-spans. However, acid inputs in the form of nitrogenous fertilisers may increase acidity levels in these soils, or generate acidity in subsoils which are not naturally acidic. In addition, removal of calcium and magnesium in harvested cane contribute markedly to the acidification process.

Identification of subsoil acidity problems

A reliable diagnosis of subsoil acidity can be obtained by soil analysis which must be conducted by a reputable laboratory, such as the Fertiliser Advisory Service at SASRI. Ideally, samples should be taken at 20 cm increments down the profile. This is best achieved by digging pits at regular intervals in the field, or by using a screw-in type auger. If the latter is used, particular care should be taken to ensure that the subsoil is not contaminated by topsoil falling into the hole or adhering to the auger as it is withdrawn.

In rainfed cropping areas, subsoil samples should ideally be taken after harvesting of the penultimate ratoon. This will allow time for the ordering and timeous incorporation of lime and gypsum after harvesting the final crop.

Correcting subsoil acidity

Worldwide, much research has been conducted into the correction of subsoil acidity. It has been found that on most soils, lime incorporated into the topsoil, whilst effective in this part of the soil profile, is essentially immobile, and has little or no impact on subsoil acidity. Furthermore, incorporation of lime into subsoils by deep ploughing or other mechanical means has often been found to be impractical and uneconomical. Gypsum, on the other hand, has been found to be far more mobile in soils than lime, and the high concentrations of calcium and sulphate in this product create a more favourable environment in subsoils for root growth. Importantly, Gypsum applications should be accompanied by applications of dolomitic lime in order to ensure adequate supplies of magnesium for crop growth.

On completion of subsoil analyses, growers are encouraged to please contact their Extension Specialist for accurate Gypsum application rates.

By Neil Miles and Rian van Antwerpen
(Senior Soil Scientists)

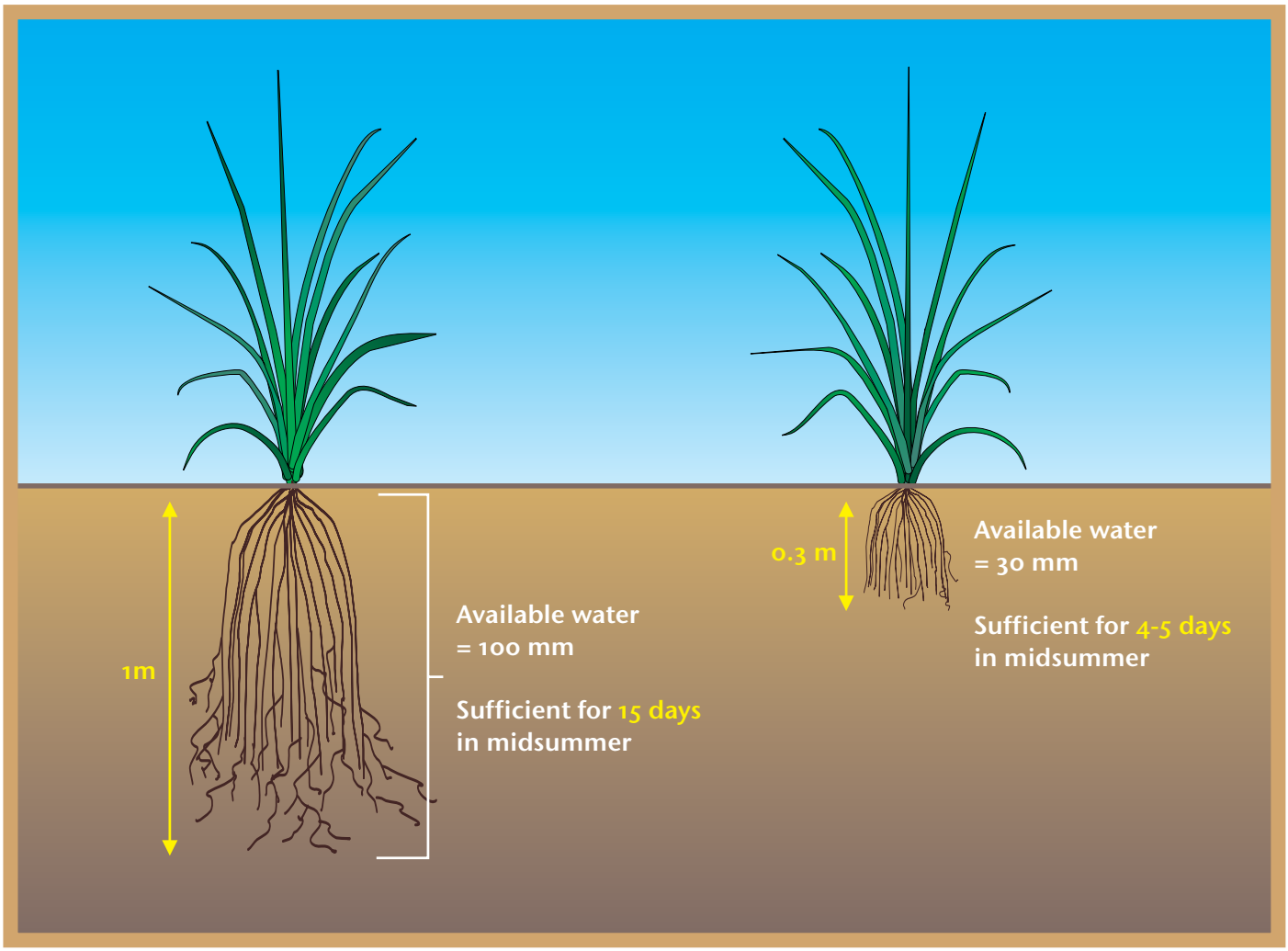


Figure 2. Typical variations in available water supplies for deep and shallow-rooted sugarcane on a sandy loam soil (crop water use in mid-summer is assumed to be 7 mm/day).

MESSAGE FROM THE DIRECTOR

'Homeground advantage' is a phenomenon that is not unique to the sports field - it also has relevance in the sugarcane field. The recent round of Director's visits into the industry has provided a valuable opportunity of meeting growers on their 'homeground', and has served as a platform that offers our specialists unique insights into grower issues specific to each region. Most importantly, these visits open channels of communication between growers and specialists that enhance joint understanding of local conditions and challenges resulting in a much stronger likelihood of shared problem-solving.

Anyone travelling in the industry at present will be painfully aware of the impact of the current drought on our crop. While this is not quite so evident in some of the irrigated areas, there is no doubt that the combined effects of poor rainfall patterns and the reduced sunlight hours at critical times in the season are having a devastating effect. Seeking to understand this impact on growers has been a keen focus of discussion in our recent round of Director's visits.

Due to the variable conditions amongst the regions, the SASRI 'away team' on the roadshow also varies, depending on the grower 'home team' issues. Nevertheless, a common thread revolves around varieties and their performance and also plant nutrition. It is well known that good management of both of these elements forms the basis of sound farming practices, and represents a significant investment for any grower. It is for this reason that we commit a significant proportion of our resources to the development of new varieties, each one of which has undergone stringent testing and protracted trialling. The same level of rigorous attention is given to all areas of our research and development programme, but the manner in which we ensure its relevance, rests with us having clear insight into grower needs and approaches. During the roadshow, it has become even more apparent to us that no one solution is the correct one – but rather that each solution requires moulding to become 'fit for purpose' – and in sugarcane agriculture there is no such thing as the 'typical canegrower'. For this reason, the importance of regular contact with growers is obvious, and our specialists welcome the opportunity to sustain these relationships.

Growers listening to presentations by SASRI Specialists held at the Jolivet/Roseveare Trust Farm, South Coast.

Donald Roseveare turns a ripper on its head to show crumble busters and the adapted spacing of the tines to suit tramline row spacing. The implement was being used to improve water infiltration in the interrow.

South Coast grower, Donald Roseveare (left) chats to Carolyn Baker (SASRI Director) and SASRI Regional Extension Manager (South Coast) Dirk McElligott.

How sugarcane responds to water stress

Research at the SASRI rainshelter demonstrated that varieties differ significantly in their respective ability and mechanisms to tolerate drought.

Sugarcane is a remarkable crop in terms of its ability to tolerate water stress. However, sugarcane cannot do without water. Yield losses, due to water stress remains the most important factor affecting cane yield in South Africa. The 2010 cutting season is currently a case in point due to limited rainfall especially along the coast.

A better understanding of typical crop response to water stress in specific growth stages may help growers predict future performance of the crop and enable them to manage the situation.

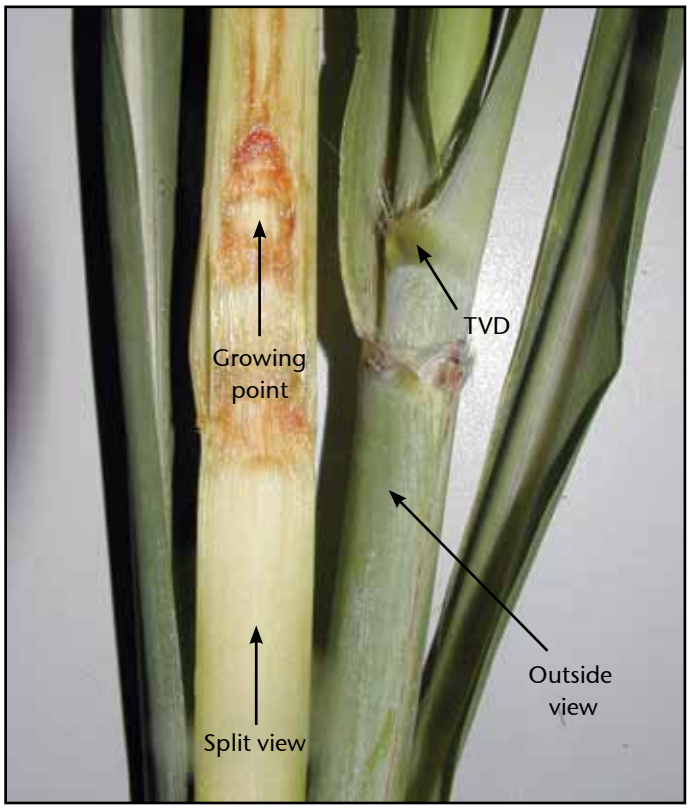
Typical symptoms when drought occurs at specific growth stages:

At time of planting or ratooning: Germination and emergence will be very poor or not take place at all.

At the tillering stage, more root growth can be expected, which can be advantageous in terms of anchoring the stool and producing a larger root area for nutrient and water uptake later.

During times of drought, the peak population will be more subdued or if the stress occurs at the time of peak population, the shoot dying-off phase will be more aggressive.

Growth of the sugarcane stalk happens sequentially. Water stress will impact on the size of the developing leaf and/or as-



Stalk elongation is the most sensitive to water stress and the internode below the Top visible due-lap (TVD) leaf (compare the outside view with the split view) will be affected first. Continued stress will also slow down the development of new leaves in the stalk apex.

sociated internode. In this way the stalk keeps record and gives the trained eye the opportunity to read off seasonal impact on growth and development.

The crop is most vulnerable when the drought comes after a wet early summer that stimulated the luxurious top growth. During such times, the crop priority is not for root growth. A late summer drought (like we are experiencing this year) can catch the crop off-guard and cause a sudden collapse of the leaf canopy. If the number of green leaves is reduced to three or less, the crop is in the green death stage when it can no longer support itself by converting sun energy.

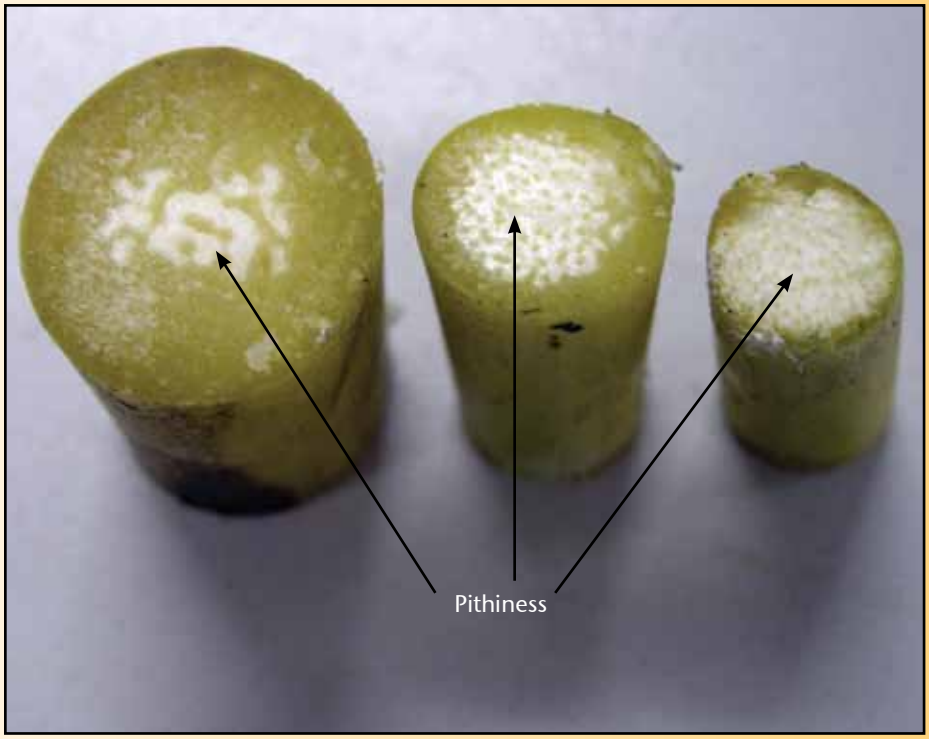
Water stress after flower initiation could lead to aggravated pithiness in the stalk. New leaves are smaller and less efficient. Stress during this time will therefore further reduce storage of sucrose and even remobilisation if necessary.

Compared to other agricultural crops, sugarcane is unique, in that mild water stress actually increases sucrose yield. Research at the SASRI rainshelter facility indicated that photosynthesis is less sensitive to mild water stress than expansive growth, resulting in increased partitioning of photosynthate to sucrose storage (4% Sucrose % Dry Matter increase relative to the unstressed control). Suboptimal water supply can therefore actually improve profitability of the crop.

Rainshelter trials have also shown that cultivars differ in their ability to tolerate water stress and even in the physiological mechanisms used to survive water stress. NCo376 has been shown to be able to extract more water from the soil than N22. N22 however, aborted leaves faster and was able to survive for longer under conditions of prolonged water stress.

Refer to SASRI Information sheet 4.5 for advice on how to manage cane affected by drought.

By
Michiel Smit (Senior Crop Physiologist)



Pithiness is caused by less sucrose deposits or redistribution of sucrose from the stem.

When the number of green leaves is reduced to three or less, the plant is left with immature leaves that do not contribute to the sucrose pool. The plant is then forced to use energy from storage for its daily maintenance.

NEW VARIETIES
for Midlands and Irrigated areas

The SASRI Plant Breeding Unit is on the verge of releasing two new varieties for the midlands and irrigated areas. The new variety 96H0588 (proposed name N52) was selected for release in the midlands whereas variety 99F2694 (proposed name N53) was selected for release in the irrigated areas.

N52: The midlands variety, 96H0588 was selected and tested in all stages of the plant breeding trials on humic and sandy soils at the Bruyns Hill and Glenside Research Stations as well as at off-station sites. These soils on which the variety was tested are the predominant soils in the midlands area. This variety produces 10% more cane tonnage than N31 and 24% more tonnage compared to N12, N16, N37 and NCo376 (Figure 1). It produces a similar sucrose content to N31. However, due to its higher cane yield, the variety produces 8% more sucrose yield than N31 and 14% more sucrose yield than N12, N16, N37 and NCo376. It is more resistant to eldana, smut, mosaic and rust than the control varieties. It produces 114,000 stalks per hectare, flowers less and canopies early. This variety showed good ratooning ability.

N53: Variety 99F2694 was selected and tested in irrigated trials at the Pongola Research Station as well as off-station trials at Pongola, Malelane and Komati. This variety produces 5% more sucrose yield than N19 . Although it produces less cane yield than N25, it produces similar sugar yield (Figure 2). This variety is more resistant to eldana, smut, mosaic and rust than the control varieties. It has a high stalk population, canopies early, flowers less than the control varieties and shows adequate ratooning ability.

By Marvellous Zhou and Shailesh Joshi (Senior Plant Breeders) and Tracy Maritz (Plant Breeder)

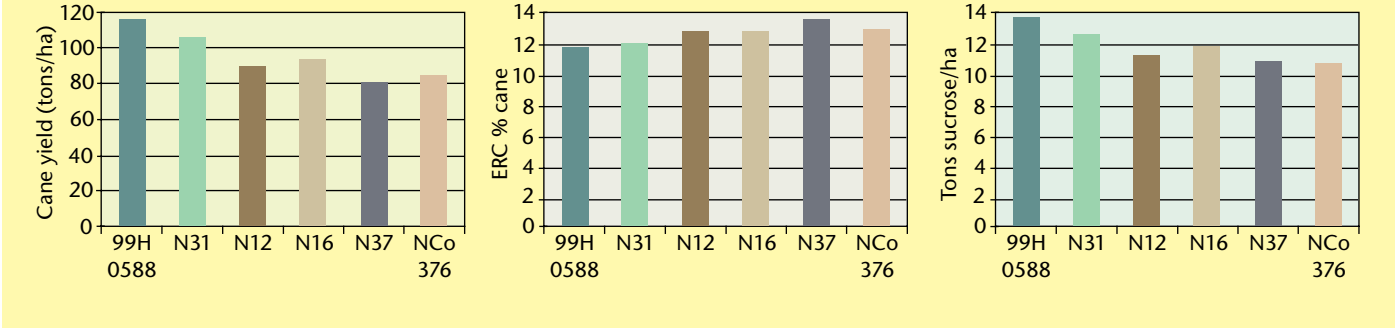


Figure 1. Cane yield, ERC % cane and tons sucrose per hectare of 96H0588 (N52) compared to control varieties.

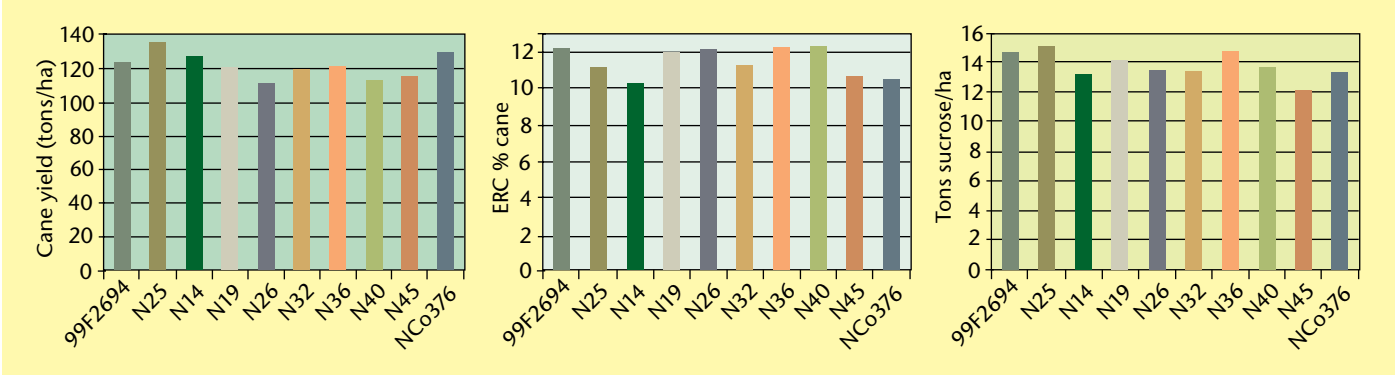


Figure 2. Cane yield, ERC % cane and tons sucrose per hectare of 99F2694 (N53) compared to control varieties.

IT DOESN'T ALWAYS PAY TO SAVE ELECTRICITY

The detrimental impact of steep electricity tariff increases on businesses is a topical issue. It is therefore a good time to explore the implications of some cost-saving strategies.

Over-irrigation

It is generally believed that a lack of irrigation scheduling results in over-irrigation. If this is indeed the case, now is the perfect time to reduce over-irrigation by making use of the many scheduling tools available from SASRI. Over-irrigation results in high electricity and water costs, leaching of expensive nutrients, soil loss through erosion and yield loss from poor soil conditions. Every effort should therefore be made to avoid over-irrigation.

Under-irrigation

A number of benchmarking and monitoring studies have shown that gross under-irrigation is often linked to crop yield losses. Because of the rising electricity tariffs, efforts to reduce electricity costs may be directed at reducing irrigation even further, which could result in even greater yield losses. The temptation may be to switch over to the Ruraflex or Nightsave option and reduce or stop irrigation during expensive peak periods. Intuitively these options appear logical and may reduce the electricity bill substantially. However, growers should be cautious when deciding on the best plan of action. The truth at the end of the day is that **"Yield is King"**. The cost of yield losses from water stress will be much greater than any saving arising from under-irrigation.

Let's explore this by way of an example. The current electricity cost of irrigating one hectare is approximately R 2000. Even if a farmer takes the extreme step of applying only half the usual irrigation (which is almost unthinkable), the electricity cost savings will be R 1000 per hectare. This really is false economy because this R 1000 saving will lead to a loss in yield amounting to several thousand rand per hectare.

It should now be clear that any strategy to reduce irrigation during peak electricity periods must be evaluated very carefully to determine the impact on cane yields and profitability before being implemented. The only time that a farmer could possibly consider under-irrigating is when the water saved is used to increase the cropped area.

By Ashiel Jumman (Research Engineer) and
Neil Lecler (Former SASRI Senior Research Engineer)

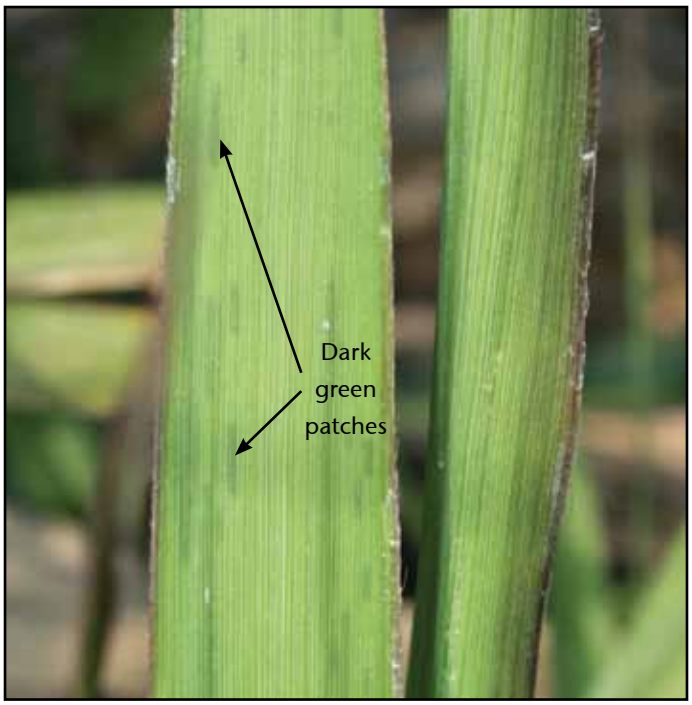
Scouting for pests and diseases

Scouting your fields for sugarcane diseases and pests is an important management tool and is neglected by many growers. The Local Pest, Disease and Variety Control Committee (LPD&VCC) teams do not have the capacity to inspect every field on every farm each year. Day-to-day pest and disease control remains the responsibility of each grower. It is therefore worthwhile training farm staff to identify important pests and diseases such as eldana, smut, mosaic, and, if common in your area, sour rot. In this way, pest and disease problems are more likely to be spotted early and their spread can be limited by roguing (removing) infected stools or in the case of sour rot and eldana, fields can be scheduled for earlier harvest. SASRI and the LPD&VCC must be alerted if unusual symptoms are seen by farm staff when scouting or undertaking other farm operations such as weeding.

The best time to scout fields for smut and mosaic is when the cane is between knee and head high and two to nine months old. Fields can be checked for sour rot while scouting for eldana when the cane is more mature. Pay special attention to fields planted with varieties that are more susceptible to the different pests and diseases. If the entire field cannot be checked, concentrate on areas where infestation is more likely to occur. These would include stressed patches, field edges, areas downwind from fields that are known to be infected and crests or tree lines that can act as spore traps when spores are wind-blown.

If smut is found in these areas, a line-by-line inspection of the field is recommended so that infected stools can be rogued. To do this, the whips should be removed, placed in a bag and burnt or buried outside the field and the whole stool (50 cm row length) should be dug out or sprayed with glyphosate. Whip roguing where infected shoots are plucked from the row at soil level and removed from the field in bags for burning is an option but is a short term solution. If the scouting is done when the cane is young, only incipient whips (elongated stalks but no visible smut whip) may be present. This is an ideal time to rogue because there will be no spore dispersal from the infected stools as they are removed from the field (Refer to SASRI Information Sheet 2.5 for more detailed guidelines on roguing).

Incipient whip developing from a smut infected stool. This is an ideal time to rogue because there is no spore dispersal at this stage.



Mosaic symtoms: Note the dark green islands on a pale green background.

If mosaic is observed, a more thorough inspection should be conducted to determine the level of infection (Refer to SASRI Information Sheet 2.8 for guidelines). Alternatively, ask your LPD&VCC to do an inspection. Note that inspections for mosaic are only reliable in summer on the coast and in the midlands due to the common and regular 'winter coat' that the crop develops which can mask the symptoms of the disease. While roguing is an important operation in nurseries and is useful in limiting mosaic spread in commercial fields, if new or low infections are observed or if the field is newly planted, the exercise is not as beneficial as for smut. This is mainly because the virus and aphid vectors have numerous alternate hosts (e.g. grasses). If high levels of mosaic (>5%) are observed, the field should be scheduled for eradication. In areas known to have mosaic it is also advisable to control and mow grasses in and next to cane fields.

If sour rot is observed, the field should be scheduled for early harvest. Do a more thorough check of stress prone areas in the field. If sour rot is widespread and severe in these areas, consider discarding the affected cane to improve your purities. Contact your Extension Specialist or LPD&VCC for advice.

If eldana is found, harvest fields within 21 days if numbers exceed the recommended threshold level set for your area. Do not carry fields over if eldana levels exceed 5e/100 unless using Fastac is an option.

Knowledge is power – doing eldana surveys on your farm is a very effective way to see where and how serious eldana is on your farm. With such information you can alter harvesting plans to remove a source of infestation on your farm. Surveys can be simple and do not require sampling in meticulous detail. A small sample taken often is much more useful than a detailed sample taken only once. Any plan that allows stalks to be sampled randomly throughout a field is fine. However, once you have settled

Internal rotting caused by the sour rot fungus.

Damage associated with eldana boring.

on a method, make sure you stick to it, so that the results from surveys taken later on can be compared with the earlier surveys. It would be useful to discuss a method with your neighbours so that you can share and compare results. In this way, a bigger area-wide picture of infestations may become apparent, leading to a clearer understanding of the pattern of eldana infestations.

Prevention and early detection is the most cost-effective approach to pest and disease control. Once a field is heavily infested it is a costly and drawn out process to manage pests and diseases and in most cases will take more than one season to achieve effectively. It is likely to be more cost effective to replant severely infested fields.

Sharon McFarlane (Senior Plant Pathologist), Marius Adendorff (Extension Specialist: Umfolozi) and Graeme Leslie (Principal Entomologist)

Please contact the Shukela Training Centre or your local LPD&VCC if training on pest and disease identification is required.

For bookings, please contact: Petro Mcauliffe

Tel: 031 – 508 7706 or
e-mail petro.mcauliffe@sugar.org.za

Topica

Growers in drought affected areas should ensure that no severely drought stressed cane is left unharvested this season. Experience in previous droughts showed that carrying over severely stressed cane is not advisable. It is better to cut the cane and allow the ratoon to regenerate. Cane that is carried over, which is not severely stressed must be checked for eldana to ensure levels are below the local LPD&VCC thresholds. If the cane is unmillable, i.e. stressed and/or heavily infested with eldana, it should be cut back and destroyed.

In some areas there has been ratoon failure due to the drought. These areas will obviously need to be re-established at some stage. Gap-planting is expensive and time-consuming, so make sure the job is done well. Gaps larger than one metre between stools will need filling. Rather carry out this operation when adequate rainfall has fallen. Ensure that healthy, good quality seedcane is used for gap-filling.

Mainly in the midlands, check mature fields (>15 months) for sour rot, a disease that is likely to be widespread this season due to the dry conditions currently being experienced. Target fields or areas within fields that are more prone to stress e.g. sandy soils and shallow areas. If sour rot is observed, the field should be harvested as soon as possible to avoid further loss in purity. If small areas within a field are infected, consider discarding the affected stalks and only sending the healthy stalks to the mill. Do not use seedcane from fields infected with sour rot.

Sugarcane smut is still very prevalent in the northern parts of our industry. Roguing of diseased stools remains the first line of defence in the fight to control smut. Begin inspecting now, early in the season, and catch the disease before whips develop.

al Tips

From now, through to summer, chemical stool eradication is the only way to effectively kill the old crop prior to re-planting. However, applying glyphosate does not necessarily guarantee a 100% kill. Take care to apply glyphosate to fully tillered, actively growing cane, no taller than knee height, using clean water. Add a buffer solution and recommended adjuvants. Do not plant until all living plant material has been killed either through removal or respraying. With seedcane fields, apply a long fallow to ensure 100% crop eradication.

The product Bandit (a.i. imidacloprid) recently acquired registration for thrips control in sugarcane. Although this product has proved successful in the control of thrips, growers should proceed with due care when using it. Apply only as recommended on the label. DO NOT APPLY BANDIT BY AIR. Insecticides such as Bandit and Fastac are now widely used in the sugar industry and their impact on the environment and especially on beneficial insects, needs to be considered. Apply only to carefully selected fields, at the correct dosage and use **only** registered application methods.

With many growers having had a poor crop and lower income this season, it is very important to ensure that every rand spent on inputs like fertiliser and herbicides, is spent effectively. Take soil samples to give you the EXACT fertiliser requirement for each field. Split applications where necessary. Use only registered and tried and tested herbicide mixes. Invest in some extra knapsacks to make sure that you can spray the largest area possible when conditions are right. What about working double-shifts when conditions are optimum for the application of herbicides, especially if you have a boomsprayer?

by Rowan Stranack (Regional Extension Manager: North Coast)

WEATHER

Review

Rainfed sugarcane production areas in S.A. received below average rainfall from February (coastal areas from January) to June 2010 (see Table). An exception was the above average January to April rainfall in Mpumalanga. Localised good rains also occurred in April in the Midlands (Noodsberg) and Zululand (Pongola, Umfolozi Felixtion) regions.

The exceptionally low rainfall elsewhere led to below average soil water content, which would have affected cane growth negatively. For example, Figure 1 clearly illustrates the situation for the Maidstone mill area, where the low rainfall led to lower soil water content in the current season compared to the same period in 2008/09. Although good rains in December 2009 created favourable soil water conditions, this only lasted for a few weeks as the crop extracted this water rapidly. Low and poorly distributed rainfall thereafter led to persistently unfavourable soil water conditions. The conditions in 2008/09 were much better.

Cane quality benefitted from the dry conditions up to now but if drought intensified further, quality will also be affected negatively.

Outlook

Moderate La Niña conditions now exist in the equatorial Pacific and are expected to persist into the 20110/11 summer. La Niña conditions are associated with above normal December to March rainfall in the South African sugarcane producing areas.

The Climate Systems Analysis Group (CSAG) at the University of Cape Town (http://www.gfcsa.net/csag.html) indicates that above-normal rainfall is more likely than below normal rainfall for the spring period. Spring rainfall forecasts from other organisations are inconclusive - normal rainfall is thus expected in these cases (South African Weather Service, European Centre for medium range weather forecasts, International Research Institute for Climate and Society).

by Abraham Singels (Principal Agronomist)

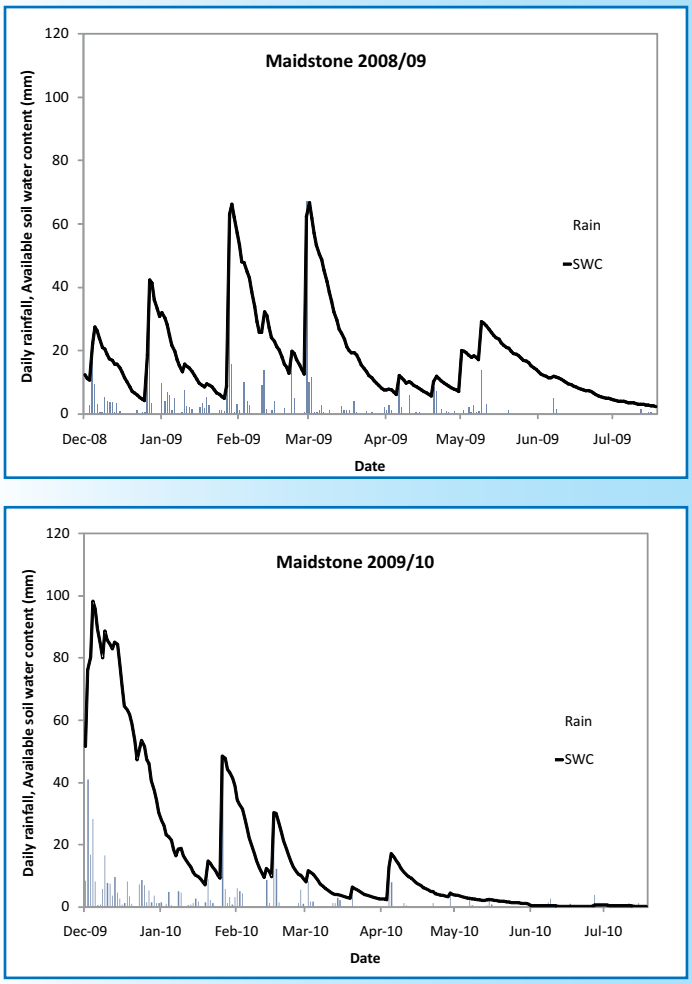


Figure 1. Average daily rainfall and simulated available soil water content (SWC) for full canopy rainfed cane for the 2008/09 and 2009/10 summers (from 1 December to 18 July) for the Maidstone mill area.

Table 1. Monthly rainfall totals and monthly reference soil water content expressed as a percentage of the long term mean for different regions.*

Rainfall	Jan	Feb	Mar	Apr	May	Jun
South Coast	82	43	45	26	47	12
North Coast	60	55	35	45	35	84
Midlands	113	64	72	95	60	55
Zululand	114	62	80	94	50	35
Mpumalanga	134	230	101	372	71	73
KwaZulu-Natal	90	57	58	65	45	35
Industry	94	65	63	89	47	36
Soil water Content	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**
South Coast	81	55	44	22	25	7
North Coast	63	52	26	38	12	6
Midlands	85	147	68	115	79	43
Zululand	84	56	67	103	35	10
Mpumalanga	60	88	55	182	135	67
KwaZulu-Natal	76	70	51	73	30	11
Industry	73	72	51	92	43	15

**Plant available soil water content calculated for rainfed conditions for a soil with a TAM of 100 mm with a full canopy cane crop growing on it.*

Why is CARBON important and how does it affect us ?

Carbon is vital to sustaining life on Earth. Today there are several carbon related issues that are discussed in the media. Below is an explanation of some of the terms commonly used in the media.

Green house gases

These are gases that trap heat rising off the earth's surface, resulting in global warming. The industrial revolution started the excessive release of greenhouse gases (carbon dioxide, nitrous oxides, methane, etc.) which originate mostly from burning fossil fuels (i.e. gas, oil and coal). These gases differ in their impact on global warming. Carbon dioxide (CO_2) has been selected as the standard gas against which other gases are measured for their green house potential. For example, nitrous oxides are 310 times more damaging than carbon dioxide and methane, 20 times. Potent nitrous oxides are released when sugarcane trash is burnt.

Carbon sequestration

Agriculture absorbs a lot of carbon dioxide through photosynthesis, but contributes to CO_2 emissions through practices such as tillage and the use of vehicles that burn fossil fuels. The process to reverse this release is termed "carbon sequestration". In agriculture our aim is to sequestrate (increase) carbon (organic matter) in our soils. Burning crops reduces the amount of organic matter returned to the soil, thereby impacting negatively on the soil microbial population. A diverse microbial population is important in creating a healthy soil environment.

Carbon footprint

This is a measure of the total quantity of CO_2 emissions that are directly and indirectly caused by an activity. The amount of energy required to perform an operation is directly related to the amount of fossil carbon needed to generate this energy (e.g. electricity from coal). Carbon is then released into the atmosphere and contributes to global warming. The top 100 companies listed on the JSE report their carbon footprint and it is only a matter of time before all industries will be required to follow suit.

In order to reduce the impact on global warming, individuals, businesses and farmers have started to reduce their carbon usage (carbon footprint) by becoming more energy efficient. An example of this would be to use smaller or more energy efficient tractors where possible. Carbon footprint can also be reduced by planting trees to offset carbon usage.

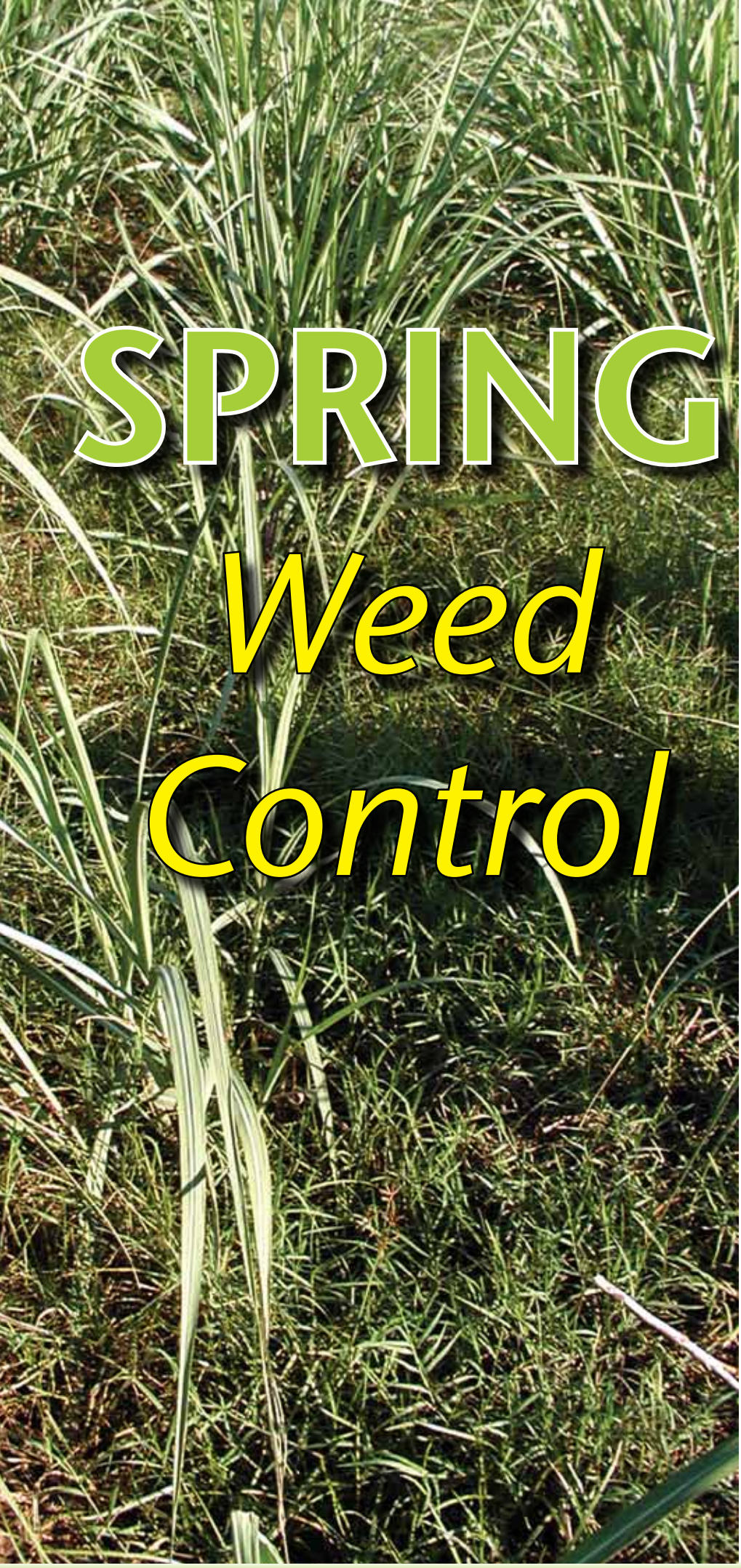
Carbon credit

This is a value assigned to a reduction or offset of greenhouse gas emissions. One carbon credit is equal to one ton of CO_2, or in some markets, CO_2-equivalent gases. Carbon credits and markets are key components of national and international attempts to mitigate the growth in concentrations of greenhouse gases (GHGs).

Carbon emissions can be offset by activities that sequestrate carbon, such as growing trees and building soil organic matter content. Carbon-neutral activities are those where the carbon used equals the carbon released: burning wood to warm a house is carbon-neutral, because, unlike fossils fuels such as coal, exactly the same quantity of carbon dioxide absorbed (removed from the atmosphere) during photosynthesis to grow the wood is released back into the atmosphere when it is burnt.

The energy value of sugarcane is more or less equally split between sugar, tops and leaves and bagasse. In order to reduce their carbon footprint, cane growers must try to harvest the energy locked in cane leaves by using it for co-generation of electricity or using it as cattle feed.

By Rian van Antwerpen (Senior Soil Scientist) & Matthew Jones (Scientific Programmer)



SPRING Weed Control

Due to prolonged drought conditions in some areas, there will be early mill closures and there may now be far bigger areas of cane land exposed to weed infestation than there would be in a 'normal' year at the same time. In addition, the recent dry spell has resulted in a sugarcane crop that will be slow to canopy. The first rains will give weeds a head start on the cane, and they will flourish over these large and vulnerable areas without any competition from a fully developed cane canopy. One practical option to remedy this crisis situation is to increase spraying capacity, involving, for example, extra knapsack operators, boom sprayers, and double shifts to cope when the rains initiate the large scale germination of weeds. Failure to take this into account will lead to drastic yield losses. Given this scenario, it would be wise to adopt the following guidelines when undertaking weed control. (Refer to Treatment selection Tables 2-7 in the SASRI Herbicide Guide 2010).

Normal spring rains

With normal spring rains, large areas with poorly canopied cane will become weed-infested. Application of medium to long-term herbicides (refer to Table 4) at the early post-emergence stage will provide pre-emergence control as well.

Dry conditions

If dry conditions persist, do not spray large areas with expensive long-term herbicides that require moisture (unless under irrigation). Three strategies can be considered during this time to avoid a bottleneck in spray operations when conditions eventually improve:

Strategy 1: After some rain, treat a limited area of the high potential fields with pre- to early post-emergence long-term products (refer to Tables 2 and 4).

Strategy 2: Apply herbicides that are persistent during times of low rainfall. With the onset of rain, the herbicides will be activated and/or carried to the root zone of germinating seedlings.

Strategy 3: If conditions continue to remain dry, let the weeds germinate until the early post-emergence stage (grasses 1 to 2 leaves and broadleaf weeds not more than 30 mm) then spray short-term treatments (refer to Table 6). If watergrass is dominant, treat at the early flowering stage.

Large weeds

Ensure that sufficient labour is available for hand-hoeing large weeds which escaped earlier chemical treatment. Alternatively use a knockdown chemical treatment.

Creeping grasses

Creeping grasses may spread excessively due to poor cane canopy. Spot-spraying of these stands (refer to Table 7) should be ongoing to avoid rapid growth and smothering poorly grown cane when conditions improve.

Verges and breaks

Apply mechanical mowing or alternatively, chemical mowing, e.g. with glyphosate, Fusilade Forte, paraquat + diuron or Arsenal, depending on the size of the cane. Direct the spray and avoid drift onto the crop. Keep verge control records, and ROTATE herbicides to avoid and reduce the risk of resistance to any one mode of action.

NB: Arsenal and other *imazapyr* formulations have the potential to be particularly harmful to cane in dry seasons.

Minimum tillage fields

Ensure that there is enough above ground plant material of the cane crop to absorb the chemical thus achieving a good kill. Another important consideration is one of water quality (Refer to the SASRI Herbicide Guide pages 65-69).

Poor water quality occurs seasonally in some areas, and may be an issue after a prolonged drought, as dissolved salts can become concentrated. Some glyphosate products (used during minimum tillage operations) require treatment of dissolved salts with adjuvants containing high grade ammonium sulphate. Avoid poor results for cane stool eradication by:

a) increasing the application rate of Roundup from 8 to 10L/ha for tough varieties,

b) adding a surfactant to assist with the spread and leaf penetration of glyphosate (follow the label directions),

c) testing the water quality regularly,

d) checking knapsack calibration:

- ensure that the knapsacks are cali brated correctly,
- use a pressure regulator,
- check that the walking speed of the operators matches the calibration (they may need to slow down if they are on task),
- ensure that the knapsacks/tanks are cleaned thoroughly and regularly.

e) Plan a long fallow to next spring for minimum tillage fields, especially in fields infested with creeping grasses. Consider using green manures as part of your control strategy.

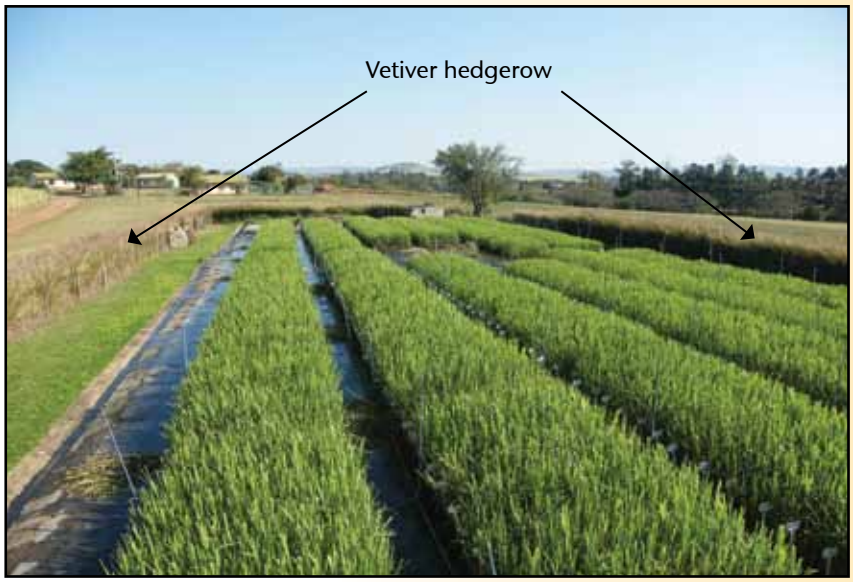
By Peta Campbell (Senior Agronomist: Weed Control)

SASRI HERBICIDE GUIDE 2010

By now, you should have received your SASRI Herbicide Guide 2010. If not, please contact Priscilla Moodley at SASRI, Telephone 031 508 7514,

E-mail priscilla.moodley@sugar.org.za. Look out for the new section on "Water quality and herbicide performance".

VETIVER *proves its practical worth*



On SASRI's Gingindlovu research farm vetiver grass (Vetiveria zizanioides) has been established from slips for use as a hedgerow and to stabilise banks.

On the SASRI farm at Gingindlovu a healthy stand of vetiver grass plants (*Vetiveria zizanioides*) have been cultivated to supplement the fence erected around the delicate speedlings grown on the terrace. The plants were easily propagated from slips and have grown into a healthy and vigorous hedgerow standing about 1.2 metres at flowering.

This hedgerow forms an impenetrable barrier against the wind thus reducing the rate of water loss occurring when the plants are irrigated with the automatic sprinkler system. This boundary provides the added benefit of keeping the scourge of rodents and rabbits out of the enclosed area where these young vulnerable plants are maintained.

There are many beneficial characteristics favouring the selection of vetiver grass as it can withstand dry as well as extreme wet conditions, it grows in almost any type of soil and under a range of pH and temperature conditions, and since no viable seed is produced the hedge persists in a neat and tidy row.

This grass has also been used with effect elsewhere on the farm where it has proven an ideal remedy for stabilising banks supporting bridges due to vetiver's thick, deep fibrous root system. For more information about The Vetiver Network consult the internet site: http://www.vetiver.org.

By Dave Gillespie (Farm Manager: Gingindlovu Research Farm) and Mike Way (Entomologist)

Vetiver can grow up to 1,2 metres.

Close-up of vetiver stalk.

Vetiver hedgerow.