

Is LA NINA COMING?

Background

The country (and indeed the region at large) is still reeling in the drought. International weather experts have indicated that the drought is over as the El Nino effects are coming to an end. There are projections that the country may be hit by La Nina, the opposite of El Nino.

La Nina is expected to come with a lot of rainfall. However, no significant rains have been received so far. River and dam levels in the sugar industry continue to decline as

fall in the summer season. The AccuWeather model predicts some minor rainfall events in September and October 2016, but normal to above normal rainfall is forecasted in summer 2016. It is hoped that the situation changes and higher rainfall received earlier.

Precautions

Although the high rainfall would be an expected relief, growers are encouraged to take the following precautionary measures to minimise the impacts of the La Nina when it comes:

- Maintenance of waterways and drains to minimise infield waterlogging and possible bursting of furrow ridges. Too much rain may not only leach nutrients, suffocate cane roots, but may result in loss of fertilizer and create unnecessary soil loss due to infield breakages of furrow rows. External drainage structures also need to be maintained to effectively take away run-off water from fields and surrounding areas. Stone pitching of waterways and drains could help in reducing further soil loss.

- As most areas are dry, high intensity rainfall will result in substantial run-off. This water will end up filling up dams and reservoirs. Precautions should be taken to ensure reservoirs are in a good state of repairs to contain the run-off water. Any repairs should be carried out timeously. Spillways and dam walls should be inspected for any possible leaks or damages due to wear-and tear and tunnels created by animals or equipment.

- Growers should also maintain access roads so that all or most parts of the farm are accessible so that operations to revive the existing crop are carried out timeously as a result of the rains.

- Raingauges should be used to measure and monitor the amount of rainfall received. Growers should check whether the current raingauges are still intact and not brittle by the foregoing long dry and hot weather conditions. Stolen, broken and brittle raingauges should be replaced. The measurement of rainfall is important for effective scheduling of irrigation.

By Noah Dlamini (Irrigation Engineer)

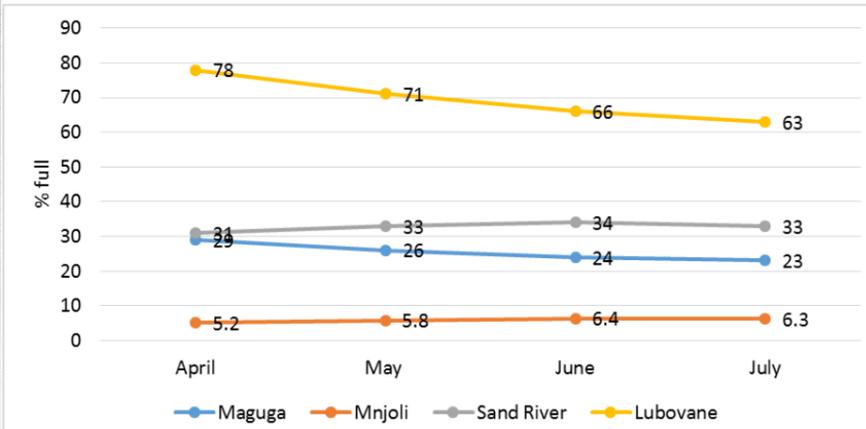


Figure 4: Industry Dam Levels (% Full) from April 2016 to July 2016

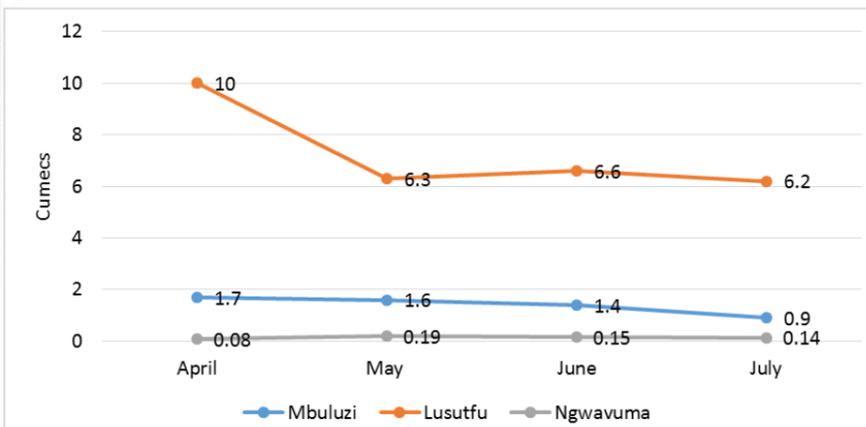


Figure 5: River Levels (cumecs) from April 2016 to July 2016

shown in Figures 4 and 5.

This situation is further exacerbated by the fact that Spring is starting and temperatures are beginning to rise. Growers are still strongly urged to continue using water sparingly and adhere to the drought management guidelines during this period.

Predictions

Weather models are not specific on when significant rains will start. However, most models indicate significant rain-



EXTENSION NEWSLETTER

Number 64

2nd Quarter 2016/17

SEASONS EFFECTS ON CANE PERFORMANCE

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Seasons effect on cane performance

“It is general knowledge that seasons affect the performance of sugarcane varieties”

Trashing in irrigated cane

“There is overwhelming evidence from literature that crop residues have significant beneficial effects”

Burn to crush delays

“Sugarcane quality deterioration impacts negatively on efficient sugar recovery at the mill, as well as on the overall sugar quality”

Introduction

In a recently held Grower Field Day in the South, it transpired that incorrect seasonal placement of sugarcane varieties is still a big challenge across all grower categories in the industry. This improper siting of varieties does not only jeopardize their genetic potential, but also the overall mill cane quality, sucrose recovery and, consequently, the profitability of role players within the value chain (Figure 1).



Figure 1: Simplified schematic of a sugarcane supply chain

Seasons effect

Generally, the milling period in the industry spans between April and December in any particular year. As a result, the cane crop is subjected to different seasons. It is general knowledge that seasons affect the performance of sugarcane varieties, or put differently, different sugarcane varieties perform differently across seasons. Accordingly sugarcane varieties are classified as early, mid- or late season. Often, the tendency is to emphasize a soil-type based classification yet seasons do have a significant impact on crop performance as well. Actually, some analyses of local (and external) data indicated a much stronger seasonal effect than soil type effect, implying the need to emphasize more on correct placement of varieties across seasons than across soil type. However, this does not suggest that the effect of soil type is insignificant.

Early season

Early season (April-June), the environmental conditions (high radiation, temperature

and soil moisture) favor vegetative growth hence more photosynthates are partitioned towards increasing the plant structure and less for sucrose accumulation. Subsequently, cane yields (TCH) are higher while sucrose content (sucrose %) is lower during this period. The recommended strategy for circumventing this scenario is to plant early maturing varieties. Early maturing varieties have inherently high sucrose content and their maturing is less influenced by

environmental conditions. These include N26, N36, N41, N49 and N53.

Mid season

In mid season (July-September), the environmental conditions promote natural cane ripening, that is, the rapid accumulation of sucrose on matured cane stalks. During this period, less photosynthates are allocated for cane growth and more are stored as sucrose on stalks. This is inarguably the most favorable season for cane growers, and there is a good balance between cane yield and sucrose content. Most industry varieties perform very well during this period. Varieties which are prone to heavy flowering such as NCo376 and N23 should not be harvested beyond this season.

Late season

For late harvesting (October-December), the cane stalk elongation period coincides with the cold winter months which do not favor crop flushing. As a result, cane yield

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SEASONS EFFECTS ON CANE PERFORMANCE ...CONT.

for late harvested cane is comparably lower than early and mid harvested cane. However, during this period environmental conditions supporting vegetative growth are improved such that with sufficient soil water supply i.e. rainfall and irrigation, crop growth is resuscitated and sucrose content/cane quality declines. Variety N25 has shown to be highly responsive to such conditions, hence growers are encouraged to harvest it before the

summer rains. Varieties recommended for late season are N25, N41, N46, M1176/77 and M1400/86.

Varieties N49, N53, N57 and MN1 are still under testing, and should they be approved for commercial cultivation, the industry variety recommendations will be updated accordingly.

By Njabulo Dlamini (Agronomist)

IS THERE A PLACE FOR TRASHING IN IRRIGATED CANE?

Background

There is a growing perception that a trash blanket (Figure 2) under irrigated cane conditions does not have any beneficial effect. Many argue that there is no place for trashing in irrigated cane. This may be exacerbated by findings of a recent study at SASRI (Pongola) which indicated that mulching had no effect on cane and sucrose yield. These findings should not be misconstrued to mean that trashing has no place on irrigated cane. There is overwhelming evidence from literature that crop residues have significant beneficial effects such as soil erosion control, weed suppression and as source of nutrients. Often, these benefits are rarely presented in monetary terms. The benefit of soil water conservation

is credited to the water conserved by the crop residues in the soil. On this basis, one of the growers indicated that they have made a conscious decision to green harvest all their cane going forward. Green cane harvesting is largely known to leave behind massive crop residue cover infield.

Future

Moving forward, it is therefore recommended that growers should make adjustments on their irrigation scheduling tools to cater for the soil water conserved by a trash blanket. On the research side, first, it would be important to assist growers with an adjustment index taking into consideration the season, soil type, trash intensity and



Figure 2: A cane field covered with a trash blanket

from a trash blanket need not be overlooked.

Trash and drought

Most studies do not account for the water conserved by the trash blanket in soil. As a result, the savings on water usage, pumping costs (energy and labor) and wear & tear on irrigation equipment is never considered. In a recent meeting in the South, growers indicated that cane in fields with a trash blanket showed more resilience to the drought conditions compared to cane in bare fields. This

area covered by trash. The SASRI study showed that varieties respond similar to a trash blanket. While there was reduced tiller emergence on mulched plots after harvesting but by the time the crop canopied the stalk population had equalized with non-mulched plots. Secondly, future studies will need to investigate strategies that may be adopted to minimize the effect of trashworm and eldana without having to remove or burn the trash infield.

By Njabulo Dlamini (Agronomist)

DOES BURN TO CRUSH DELAY ENHANCE SUCROSE?

Introduction

There is a growing perception among some sugarcane growers that delaying crushing of burnt and cut cane enhances sucrose content, hence profitability. This perception is supported by the observable slight 'increase' in sucrose content a few days after burning and cutting.

Illusion

Actually, this 'increase' in sucrose content is illusional. It comes about as a result of cane weight loss emanating from combined moisture and respiration losses. The 'increase' in sucrose content caused by delayed crushing is attributed to the increase in sucrose concentration arising from cane weight loss. This gives a false impression that cane quality has improved. A study done by Lyne and Meyer (2005)* showed that although there was an increase in sucrose content within four days after cutting, the loss in cane weight was massive (Figure 3) and the result was a loss in revenue.

temperature and humid conditions. Cane excessively applied with nitrogenous fertilizers or affected by pests and diseases reportedly deteriorates quicker than a healthy crop. Some studies indicate that the rate of deterioration differs among sugarcane varieties, while others report non-significant differences. There is overwhelming evidence from literature that burnt cane deteriorates more rapidly than unburnt cane, some studies reporting two to three times more sucrose losses with burnt cane compared to unburnt cane. It is envisaged that a delay in milling burnt cane exacerbates such losses.

Burning

Burning causes injuries on cane stalk and these injuries expose the cane to infections which hasten deterioration of juice quality. This in turn impacts on the quality of the sugar produced at the mill. Besides entering through burn injuries, the micro-organisms responsible for the quality decline also enter the cane stalk through the cut ends. As a result, prolonged exposure of cane to these micro-organisms by delayed crushing accelerate the rate of sucrose loss.

Burn to crush delay

While climatic factors may be beyond grower control, however, burn to crush delays can be managed. This can be achieved by matching harvesting operation, cane delivery and milling cycles as closely as possible to one another. Growers must strive to have their burnt cane milled at most within 48 hours. This is possible provided there is sufficient harvesting equipment, cutting and gleaning labour, and daily burnings match mill

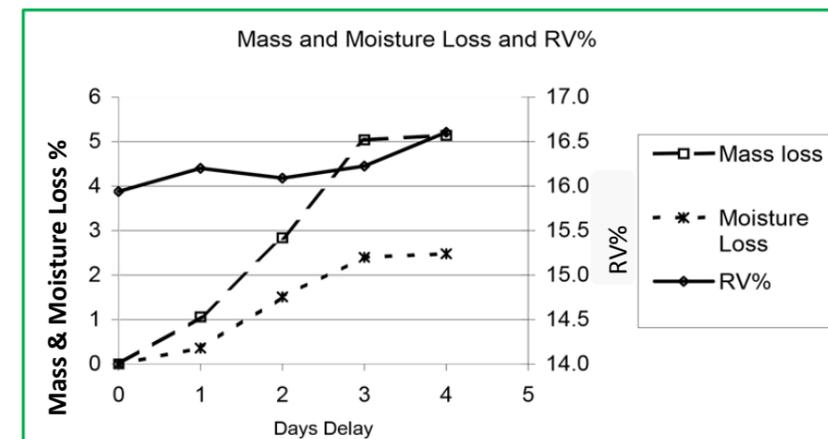


Figure 3: Mass loss, moisture loss and RV% over a four day period during a warm season (Adapted from Lyne and Meyer, 2005)*.

Impact

Sugarcane quality deterioration impacts negatively on efficient sugar recovery at the mill, as well as on the overall sugar quality. The delivery of consignments of deteriorated sugarcane to the mill has detrimental effects at multiple process units, and under extreme circumstances may lead to a factory shut-down. The monetary losses to growers, millers and other players within the sugar industry as a result of delivering stale cane for milling are enormous. As a result, growers are encouraged to endeavor to deliver good quality cane at all times.

Factors

Factors that worsen cane deterioration are burning, burn to crush delay, condition of cane at burning, temperature and humidity. The deterioration rate is faster under high

rateable. This then demands accurate cane yield estimation.

Deterrent

To promote the delivery of high quality sugarcane to factories, some sugarcane industries have incorporated a deterioration quality parameter in their sugarcane payment formulae. This is done to serve as a deterrent against the delivery of overly deteriorated cane and to encourage better management practices. However, the drawbacks associated with the technique of determining the deterioration of cane quality deter adaptation of this practice by most factories.

By Njabulo Dlamini (Agronomist)

*Lyne, P.W.L and Meyer, E. (2005). Impacts of harvest to crush delay on grower revenue. *Proc S Afr Sug Technol Ass* 87: 428 - 434.