

MANAGING HEAT STRESS FOR FIELD WORKERS

Introduction

Climate change has come with major impacts worldwide which include increasing temperatures. The rise in temperatures pose a serious threat to human health as a result of heat stress. Heat stress is an illness that is caused by prolonged exposure to extreme heat. It occurs when the body is unable to maintain a healthy temperature in response to a hot environment.

Workers who are constantly exposed to high temperatures are at risk of developing heat stress which can cause heat stroke leading ultimately to death. Cognitive/reasoning function and productivity is also impaired. When workers become too hot, they may become irritable, have a reduced attention span and diminished work capacity. The goal of managing heat stress is to reduce the impact of the factors involved.

Heat stress management

The purpose of heat stress management is to monitor and report on heat exhaustion for farm workers in the fields to avoid heat stroke. To mitigate the impact of heat stress on farm workers' wellbeing and productivity, growers are encouraged to resume field work much earlier during the summer months. Below are some points to consider when managing heat stress:

- Provide supervised rest periods when it is too hot and provide each worker with plenty of clean drinking water to avoid dehydration and severe thirst. Employees should be encouraged to drink a lot of water (2 litres or more depending on the type of work) under such circumstances.
- Where possible, shade should be provided within the working area.
- Encourage workers to wear broad-brimmed hats and lightweight clothing to reduce direct exposure to the sun. Wearing heavy duty industrial clothing increases heat stress in workers by trapping air against the skin, increasing its humidity and reducing evaporation.
- Use cooling vests and other cooling clothing or accessories to help keep overall body temperature at a moderate level.
- Workers should be encouraged to wear lightweight, sweat-wicking and fast-drying clothes. Sweat causes the body to work even harder to stay cool as it adds an insulating layer on the skin.

It is of utmost importance that farmers/employers take care of their employees by monitoring and reporting the levels of heat to prevent issues such as heat exhaustion, heat stroke and death. This will help in maintaining high labour productivity even in the hot summer period. Some growers start monitoring

once the wet bulb thermometer reaches 24°C, and release field workers once it reaches 28°C.



A farm worker covering her head and neck with a lihiya fabric which may inhibit air circulation



A farm worker wearing a broad-brimmed hat



Lwazi Dlamini (Extension Officer - North)



ESWATINI SUGAR ASSOCIATION TECHNICAL SERVICES

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Variety N49 promoted

"Variety N49 is recommended for early season growing..."

4R principles

"...applying the right source of nutrients, at the right rate, at the right time and in the right place"

Field practices promoting soil health

"A healthy soil is a requirement for a better crop."

Managing heat stress

"... is caused by prolonged exposure to extreme heat."

Variety N49 promoted

Introduction

Variety N49 was imported from the South African Sugarcane Research Institute (SASRI) into the country for multiplication at the Simunye trial site in year 2012. In the autumn of 2013, the variety was introduced into the industry variety testing programme. To this end, the Technical Services department of ESA is confident that the variety has been adequately tested across the different industry soil types and seasons. The data collected during the testing years is sufficient to produce meaningful recommendations for grower use.

Performance

Variety N49 is recommended for early season growing due to its inherently high sucrose content and average cane yield. This is supported by its consistently high and exceptional performance during the early season across all soil types although there is an indication that yields can be compromised under poor draining soil. Mid-season results indicate that the variety performed relatively poor under both good and poor draining soils, and performed well under intermediate draining soil conditions. Late season, yields were not impressive under poor draining soils while they were comparatively better under intermediate draining soil.

Trials data indicate that the average cane yield and sucrose content of N49 are 93.4% and 113% that of N25, respectively. Consequently, average sucrose yield is 105.5% that of N25. With the current shortage of early season varieties, it is envisaged that the release of this variety will bring a great relief to growers.

Other characteristics

Variety N49 has demonstrated to be resistant to both major industry pests and diseases such as Eldana, thrips, aphids and smut. These observations have been confirmed by large growers already having it at commercial level. N49 responds well to both ethephon and fusilade applied individually. Under high yield potential, the variety has shown to be moderately prone to lodging owing to its taller stalks that are relatively thicker than those of N25.



Approval

Council has since approved that N49 be promoted from category 2 to category 1, implying that the variety can be accessed by all industry growers without exception.



Njabulo Dlamini (Research Agronomist)

THE 4R PRINCIPLES OF FERTILIZER MANAGEMENT

Introduction

Fertilizer application is one of the major operations in sugarcane production, and therefore its management is very critical. The 4R principles of applying the **right source** of nutrients, at the **right rate**, at the **right time** and in **the right place** is expected to optimize nutrient use by the sugarcane crop leading to increased productivity and farm profit from sugarcane production. Adhering to these principles ensures that fertilizing material does not end up in untargeted sites. The goal of best practice in fertilizer application is to match nutrient supply with crop requirements and to minimize nutrient losses from fields.

4R Principle

R1 - Right source of nutrient (match fertilizer type to crop need)

Select the correct source of nutrient for your soil ensuring a balanced supply of essential plant nutrients. The selection starts with taking soil samples to the laboratory and ensuring the samples are correctly taken. The fertilizer recommendation will specify the correct fertilizer type to apply. It is very important that growers purchase their fertilizer from reputable suppliers to ensure that the right source of nutrient is applied. The label on the bag should specify the nutrients as well as their proportions.

R2 - Right rate (match amount of fertilizer to crop need)

Consider the availability of nutrients from all sources (e.g. livestock manures, commercial fertilizers and atmospheric nitrogen fixed by legumes). Growers should take annual soil samples in order to ensure that the fertilizer they apply meet the crop requirements while accounting for the nutrients already in the soil. Calibration of application equipment to deliver target rates is therefore very important. Over application of fertilizer can be wasteful and cause a reduction in yields, while under-application can lead to crop loss. The crop loss could be due to deficiency of the under applied nutrients.

Deficiency symptom's can be corrected by applying remedial fertilizer as per the fertilizer recommendation based on either soil or leaf sampling.

The costs of soil sampling, laboratory analysis and the accompanying fertilizer recommendations are negligible in relation to the total cost of fertilizer applied over a whole crop cycle.

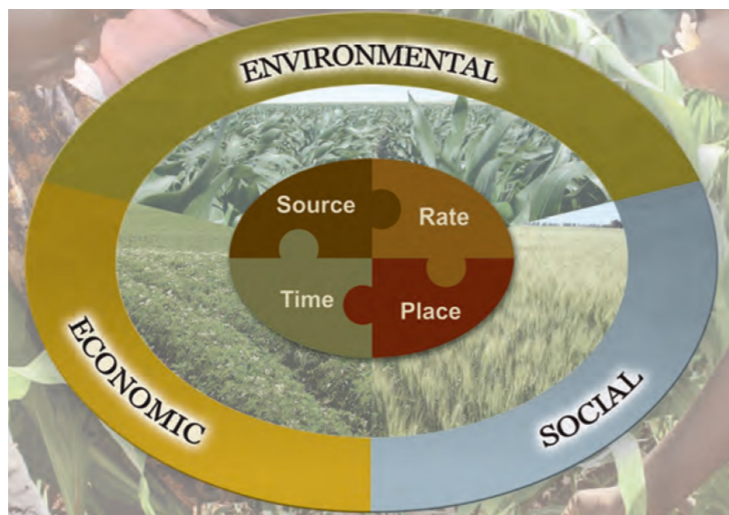
R3 - Right time (make nutrients available when crop needs them)

Timing of fertilizer application has a significant effect on crop yields. Proper timing of the fertilizer application increases yields, reduces nutrient losses, increases nutrient use efficiency and prevents damage to the environment. The sugarcane plants nutrient requirements differ with the different growth stages. In order for the nutrients to be available when the plant

needs them, fertilizers should be applied at the right time. The drip irrigation system gives flexible times of nutrient applications. For more information on the ideal timing of fertilizer application, Growers are referred to their respective extension officers.

R4 - Right place (keep nutrients where crops can find them)

The fertilizer should be applied or placed where the plant roots can access it easily. In overhead and furrow irrigated fields, delayed top dressing should be avoided since that leads to improper placement of fertilizer. Fertilizer should be applied on the ridge for overhead irrigation and on the shoulder of the ridge for furrow irrigated fields. Basal fertilizer at replanting should be placed on the furrow. To avoid volatilization, fertilizer should be irrigated immediately after application. In furrow irrigated fields application should be staggered or alternatively incorporated with chiseling.



Sicelo Masuku (Extension Officer - South)

FIELD PRACTICES THAT IMPROVE SOIL HEALTH

Introduction

Soil health is one of the fundamental aspects in crop production and an understanding of some of the best practices in sugarcane production is essential to maintain a good environment necessary for plant growth. A healthy soil is a requirement for a better crop. The sugarcane plant draws lots of nutrients from the soil for its growth. These nutrients have to be replenished to the soil in order for the crop to grow well. The production of sugarcane involves the use of heavy machinery, and their timing is very critical to minimise soil compaction especially under wet soil conditions. Microbial life also thrives well in a healthy soil and this also assists in the breakdown of organic matter and aeration of the soil. Practices which enhances microbial life in the soil are therefore encouraged.

Management practices that enhance soil fertility

Improper soil management practices can lead to undesirable changes in the chemical, biological and physical properties of the soil. Such changes may result to reduced cane yield. Factors that are a threat to the health and sustainable use of the soil must be avoided where possible or the impact thereof be minimized. Some points to consider when managing the soil include, amongst others, the following;

- Aiming at increasing the soil organic matter levels by adding organic amendments, practicing longer fallow periods and planting cover crops or green manure crops such as sunnhemp which assists in breaking pest and disease cycles in the soil. Incorporating sunnhemp into the soil also helps improve the fertility of the soil.
- Protecting the soil surface by mulching. A mulch blanket: reduces the impact of raindrops on the soil hence minimizing the loss of soil; assists in keeping the soil moist which also enhances biological life; reduces soil water loss through evaporation; replenishes the soil with plant nutrients; reduces soil compaction from

farm machinery; and, reduces the proliferation of weeds.

- Monitoring irrigation and using good quality irrigation water to reduce the drastic impacts of salinity and sodicity.
- Applying the recommended fertilisers and soil amendments. It is therefore important for growers to send correctly taken soil samples to the laboratory so that fertilizing material is applied based only on soil tests.
- Employing erosion preventative measures to avoid the loss of soil. These include planting grass on waterways, ploughing across slope as opposed to up and down the slope, and maintain soil cover as mentioned earlier.
- Avoiding compaction by correctly timing field operations. Avoid the use of heavy machinery on wet soils. Heavy machinery on the soil increases the soil bulk density. Soil compaction

reduces: soil aeration, microbial activity, movement of water down the soil profile and deeper root growth. These eventually lead to reduced cane yield and farm profit.

- Control in-field traffic by using only the designated traffic zones during harvesting. This limits compaction to certain parts of the field and cul-

tivators can be used to loosen the soil on only the zones used by the machinery.

Growers are therefore encouraged to embrace these best practices in order to keep soils healthy. Healthy soils guarantee sustainable sugarcane businesses.



A tractor ploughing-in sunnhemp in one of the estates



Welcome Shongwe (Extension Officer - North)