HIGH SMUT (SPORISORIUM SCITAMINEUM) LEVELS

Introduction

Since the annual smut surveys began in September 2023, fourteen high smut notices have been issued to growers across the industry. This suggests that smut infection levels have been relatively high this year.

High smut notice

This is a warning given to a grower whose fields have been found to have smut levels above the allowable limit. According to the P&D Control Regulations, allowable smut infection limits vary depending on the region with 5% and 1% for the lowveld and the high-

COMPULSORY PLOUGHOUT PROCEDURE FOR SMUT

3.1 Maximum allowable smut levels

The maximum levels as approved by the Council of the Swaziland Sugar Association for varieties and ratoons in Malkerns and the rest of the industry are tabled below

Area	Variety	Ratoon age	Maximum smut % infection allowed
Malkerns area	All Varieties	All Ratoons	1
Rest of the industry	All Varieties	All Ratoons	5

The Malkerns area is defined as comprising those Growers who draw water upstream from the confluence of the Usuthu and the Usushwane rivers

Figure 3: An extract from the industry P&D control regulations

veld, respectively (Figure 3).

Possible causes of high smut levels

Smut is spread through the soil, air and water with primary infection occurring from soil-born spores or infected seedcane. Smut is a considered to be the most serious and widely spread disease of sugarcane causing economic losses due to the impact on the yield of sugarcane. The disease is known to be more serious under poor growing conditions. Conditions that favour smut development are long, dry and warm winters followed by good spring rains. The rainfall received in July across the industry was above the 2022 rainfall and long-term mean. This may be one of the reasons which may have caused several fields to be having high smut level. Other causes are:

•Planting infected seedcane - Use of uncertified cane as seedcane –practice of using commercial cane for planting has been reported though not yet verified.

•Failure to observe adequate fallow period during replanting - smut spores survive for a long time in

the soil.

•Failure to cut at the base – too many stumps have been noticed in fields across the industry.

•Poor stool eradication during replanting resulting in volunteers which re-infect the newly established crop.

•Planting of highly susceptible varieties (e.g., NCo376 and M1176/77) especially by small-scale growers who may not have the capacity to manage the disease. Despite being gazetted for commercial cultivation, ESATS discourages growers in general and small-scale growers in particular from growing these

two varieties. This is not unique to Eswatini since smut has forced to stop the commercial cultivation of many high-yielding varieties in many other industries around the world.

Impact on yields

Research across the globe has shown that smut causes serious cane yield and sucrose losses which may range from 12% to 75%. Severe infection can result in complete crop failure.

Actions to keep the smut level low

In the past ten years, smut level has been kept well under control with the average industry being less than 1%. However, it is important to

note that there were compulsory plough out orders issued within the same period. The following practices are listed as a reminder to growers to observe:

•The use of certified seedcane for planting. This requires planning replanting at least three years in advance.

•The use of resistant/tolerant varieties. Avoid susceptible varieties.

Regular scouting and rouging of all fields

•Adherence to a minimum of three month fallow period after crop eradication.

•Proper stool eradication – ensure that there are no volunteers since they serve as host for smut.

•Where possible, irrigate before planting to induce smut spores to germinate and die because there is no cane to infect.



INSIDE THIS ISSUE: Soil & water: a source of life The drawback of replanting outside recommended times

> High Smut (Sporisorium scitami- 3 neum) levels



Soil & water

Soil and water are the medium in which plants in the short to long and grow essential nutrients

Replanting times

There are two at which growers can replant their fields, and these are autumn and spring

High smut levels

Failure to observe adequate fallow period during replanting

Number 92

Introduction

05 December, is recognised internationally as World Soil Day (WSD). This is particularly important because of the role the soil plays in supporting human, plant and animal lives. The year 2023 was no exception, the WSD was celebrated under the theme "soil and water: a source of life".

The sugarcane industry also recognizes the importance of soil in cultivation and nurturing of the sugarcane crop. The twins of soil and water must be well managed if sugarcane growing businesses are to thrive obtain term. In conjunction with the climatic factors, radiation and temperature, soil and water are determinants of cane and surecommended windows crose yields. If poorly managed, the sustainability and profitability of sugarcane growing will be highly compromised.

Essentials of soil and water

The Food and Agriculture Organization (FAO) of the United Nations highlighted four essentials of soil and water in crop production, which are equally ap-

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SOIL & WATER: A SOURCE OF LIFE

plicable to sugarcane growing.

Soil and water are essential resources for sustaining life on Earth.

• Soil and water provide the foundation for food production, ecosystems,

> and human well-being. Recognizing their invaluable roles, we can take proactive measures to safeguard these resources for future generations.

> • Soil erosion and compaction disrupt the capacity of soil to store, drain and filter water, and exacerbates the risk of flood, landslides and sand/dust storms.

> • Soil and water are the medium in which plants grow and obtain essential nutrients.

> • Healthy soil plays a

crucial role as a natural filter, purifying and storing water as it infiltrates into the ground.

\$ Soil and water are interconnected resources that need integrated management.

• The health of the soil and the quality and availability of water are interconnected.

Continued in the next page

SOIL & WATER: A SOURCE OF LIFE CONT...

practices enhances water availability for agriculture. Healthy soils, enriched with organic matter, play a crucial role in regulating water retention and availability.

• Efficient use of quality water, promoting the sustainable use of fertilizers and pesticides, employing appropriate irrigation methods, improving drainage systems, controlling pumping, and monitoring soil and groundwater salinity levels are essential to maintaining sustainable agricultural practices.

Sustainable soil management is key to improve water productivity in irrigated systems.

$\overset{}{\otimes}$ Improper soil and water management practices affect soil erosion, soil biodiversity, soil fertility, and water quality and quantity.

- Water scarcity leads to the loss of soil biodiversity, while leaching and eutrophication from agriculture practices lead to the loss of biodiversity in water bodies.
- The mismanagement of pesticides and fertilizers not only threatens soil and water quality but also poses significant risks to human health and ecosystems.

 Rising water table levels contribute to land loss, increasing the risk of soil salinization and sodification, which can negatively impact agricultural productivity.

 Implementing sustainable soil management
Poor irrigation and drainage practices are some of the main drivers of soil salinization.

% Soil and water conservation contribute to climate change mitigation and adaptation.

 Improved soil and water management improves the land's capacity to withstand extreme climate events such as droughts, floods and sand/dust storms.

 Integrated soil and water management practices provide essential ecosystem services, supporting life on earth and enhancing ecosystem resilience.

 Healthy soils act as a carbon sink, by sequestering carbon from the atmosphere, thus contributing to both climate change adaptation and mitigation efforts.

Conclusion

Growers are therefore strongly encouraged to embrace practices that improve soil health, reduce erosion and pollution, and enhance water infiltration and storage such as minimum tillage, crop rotation, organic matter addition, and cover cropping. These practices also preserve soil biodiversity, improve fertility, and contribute to carbon sequestration, playing a crucial role in the fight against climate change



THE DRAWBACK OF REPLANTING OUTSIDE **RECOMMENDED TIMES**

Introduction

In recent years, there has been growing trends of growers replanting their sugarcane fields outside recommended times. Absence of land preparation equipment is cited as the main cause of this anomaly.

There are two recommended windows at which growers can replant their fields, and these are autumn (March-April) and spring (August-October).

These replanting windows are largely determined by climate (Figure 1). The autumn replanting happens at the tail end of summer rains but before the onset of winter. Due to its relative shortness, minimal replanting occurs during this period. The spring replant window targets the period after low winter temperatures and before the onset of spring rains.

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THE DRAWBACK OF REPLANTING OUTSIDE **RECOMMENDED TIMES CONT**...

Yield penalties

It critical that growers aim to plant their fields within these periods because

the yield penalties associated with replanting outside them are huge. Planting during the winter period when temperatures are low compromises the germinating ability of the seedcane. Targeting replanting during the rainy months leads to delays due to unworkable soil conditions. Planting on wet soils is known to cause compac-

tion and improperly covered seed leading to poor germination, low yields and short ratoon crop cycles.

Late season planting

Most reports indicate that growers particularly smallscale growers replant their fields after October, sometimes stretching to December/January. In the sugar industry, it is general knowledge that late season harvested cane has low

mid season cane (Figure 2A). So, by planting most sugarcane fields during this period or thereafter inevitably places the crop to low yield potential conditions. The main reasons why late harvested cane achieves comparably low yields is that the crop does not fully benefit from the ideal growing conditions experienced by the other harvest seasons. For late season harvests, the critical period of growth which is stalk elongation, occurs when temperature, radiation and rainfall are at their lowest. Instead, these conditions occur during the growth stages of emergence and tillering.

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120 Autumn 100 80 í 60 40 20 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Figure 1: Autumn and spring replanting windows



Figure 2: Average yields of large growers by harvest season (A) and average yields compared to early and yield across ratoon crops (B). ES: early season; LS: late season; MS: mid season

Ratoon yield decline

Beside the generally low cane and sucrose yields



late season, the longevity of ratoon crop cycles of cane harvested during this period is relatively short due to large ratoon yield decline (Figure 2B). This implies that late season harvested fields are frequently replanted when compared to fields harvested in the other seasons. In economic terms, late season crops are less profitable than early and mid season crops. This therefore

severely compromises the sustainability of sugarcane growing and milling businesses. The penalty on cane replanted during the spring rain period is even higher.

Conclusion

Growers are therefore encouraged to prepare medium to long term replant programmes that are reviewed annually to ensure that replanting happens at the recommended times.



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