

# PERSONAL PROTECTIVE EQUIPMENT

## Introduction

The occupational and safety act of 2001 is a vehicle that safe guards the wellbeing of employees under various aspects of production. This law is mandatory, as such, all employers and employees units are expected to abide by it. The act encompasses a wide spectrum of obligations for all parties concerned, employers and employees. For this article, focus will be on personal protective equipment (PPE).

## What is PPE?

PPE according to the act refers to equipment that is used by employees to protect themselves against unsafe conditions in the work place. [Examples of PPE are shown in **Figure 4**]. This equipment is provided by the employer to the employee free of charge and it is incumbent upon the employer to educate employees on proper use for maximum protection. In the sugarcane industry, most operations require the use hazardous tools and chemicals and it is therefore important to identify the correct PPE for specific tasks by conducting meticulous risk assessments.

action is taken on time to eliminate occurrence of work injuries as a result of such.

## Costs

Injuries and loss of life that are related to not using or improper use of PPE can be very costly to the business due to production stoppages, investigation time, medical costs, and reputational losses to mention but a few.

## Compliance

For every business in the Kingdom of Eswatini, including sugarcane growing, it is important to comply with national legislation and international standards that safe guard the health and safety of employees in the work place.

**It must be known therefore that personal protective clothing is not an option but a requirement regardless of cost.**



**Figure 4:** Some personal protective equipment (PPE) used in the work environment

## Risk assessment

The risk assessment is the baseline tool of determining the risk and hazards related to each activity being done in a workplace. Furthermore, it informs of the controls that an employer should put in place to minimise the negative effects of the identified risks. PPE is one of the controls that should be in place to mitigate the effects of occupational risks. An employee must always use, in a proper manner, the provided PPE when undertaking any activity assigned by the employer. It is the employee's duty to report worn out and defective PPE to the employer so that corrective

## Assistance

Where growers are uncertain of the type of PPE their employees should use, they are strongly encouraged to seek assistance from their area Extension Officers.



**Bongani Sibanyoni**  
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ESWATINI SUGAR ASSOCIATION TECHNICAL SERVICES

# EXTENSION NEWSLETTER

Number 82

4<sup>th</sup> Quarter 2020/2021

## CLIMATE CHANGE EFFECTS ON WATER MANAGEMENT

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### Climate change effects

A review of historical climate data revealed that there are some observable climate change effects

### Frost damage on a nursery field

Literature indicates that frost damage can cause severe losses in cane growth

### Personal protective equipment

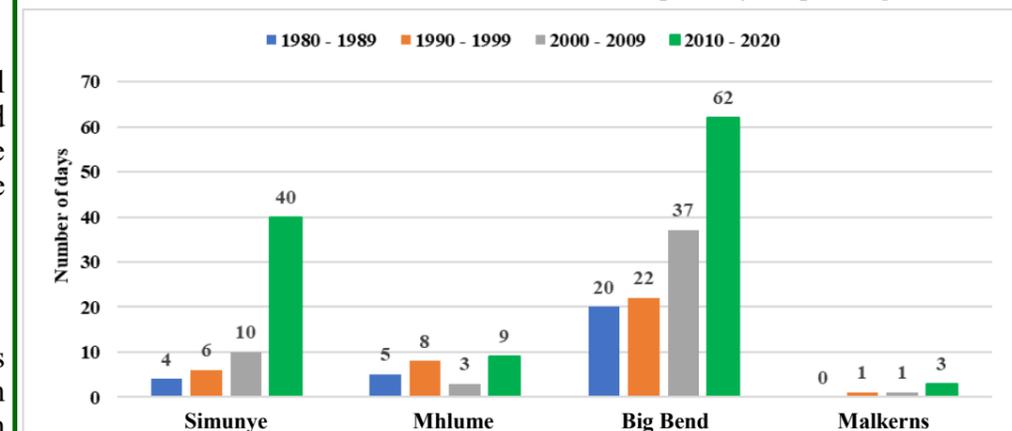
It must be known therefore that personal protective clothing is not an option but a requirement regardless of cost

### Introduction

Weather refers to the day-to-day state of the atmosphere, such as hot or cold, wet or dry, calm or stormy, clear or cloudy. Climate is the term used for these atmospheric conditions over longer periods of time. Climate change is a global transformation of the conditions of the atmosphere characterized by the changes in the usual climate which can last for an extended period of time or variation of time; or change in long-term-means or resulting to a fewer or more extreme weather events. Agricultural activities, including sugarcane production, are affected by the effects of climate change. A review of historical climate data revealed that

### Increased frequency of heat waves

The sugar industry maximum temperature trends in the past forty years, showed that in spring and summer seasons there are now more frequent occurrences of maximum temperatures exceeding the 40°C mark (**Figure 1**). These extreme high temperatures are normally referred to as heat waves. The heat waves were on the rise in the past ten years, and they were either accompanied by humid or dry air. Under dry hot conditions, plants tend to close their stomata (temporary wilting point) to conserve water hence affecting growth rate which may lead to yield decline especially if prolonged or oc-



**Figure 1:** Frequency (days) of maximum temperature reaching 40°C & above in the past 40 years in the sugar industry

there are some observable climate change effects affecting water management in the sugar industry.

### Observable trends of climate change

The following climate change effects have been observed in the sugar industry from the review of the climate data trends of the past and recent years.

curing frequently. Temporary wilting point is more severe in water stressed sugarcane. Growers are advised to adequately irrigate their sugarcane crop to counteract heat wave effects. This can be achieved by proper irrigation scheduling. Severe heat waves can damage

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## CLIMATE CHANGE EFFECTS CONT...

the crop, particularly the tender leaves. Within the last 40 years, the highest maximum temperature ever recorded was 45.4°C at Simunye on 24 December 2016; followed by 45.0°C in Big Bend on 20 February 2016. Such temperatures are common in deserts. High temperatures such as these have a bearing on the growers choice of an irrigation systems. Under such conditions, irrigation systems that cover the whole field within a short space of time are required in order to protect the crop.

### • Frost in the lowveld

In ESA Newsletter No. 81, a frost damage was reported in the Lowveld during the 2020/21 winter season. At Eswatini, frost commonly occurs in the Highveld but due to climate change it is anticipated that frost occurrence in the Lowveld will be more frequent going forward. The Lowveld is known to be warmer than all the other regions and cases of frost were not expected; but due to rise in cold waves, frost formation is spreading to this region as well. A cold wave (or front) is defined as a rapid fall in temperature within a 24-hour period. Frequent occurrences of cold fronts are one of the effects of climate change. At the moment, frost in the Lowveld is observed at selected places but with the rising change in climate, extreme winter cold could be experienced covering more areas in the Lowveld going forward. Extreme cold waves do not only kill the cane but also freeze water in pipes thus affecting or delaying irrigation events. Growers are advised to be watchful of the effects of extreme cold weather conditions in the lowveld during the winter season.

### • High rainfall intensity

In the past forty-years, there have been instances where rainfall collected within a 24-hour period exceeded 100mm (data not shown). The increase in high rainfall intensity is claimed to be caused by climate change (global warming). Recently, the sugar industry was affected by Cyclone Eloise and other subsequent heavy rains that exceeded 100mm within a 24-hour period. Manual weather stations had a challenge recording these amounts of rainfall as they use rain gauges with maximum capacity of 100mm. Since high rainfall intensity is on the rise, growers are advised to take readings more than once within a 24-hour period to avoid missing some of the required data. To address this gap, some growers are proposing that bigger volume rain gauges be sourced or manufactured. Efforts are being made to ascertain

if this is possible. Growers with automatic weather station (AWS) were, however, able to record whatever amounts within any given period. Investing in AWS is recommended going forward especially because they also give real time data.

The recent heavy rains were good in filling up water storage dams and raising river flows, however, growers abstracting water directly from the rivers were affected as some pumps, motors, electrical panels and VSDs were submerged in water. Also, pump houses, irrigation systems, infield and access roads were damaged. Therefore, growers are advised to take warnings seriously from weather experts and promptly remove movable irrigation equipment to safety to minimise losses when such events are predicted in future.

### • Skewed rainfall distribution

Apart from the flooding, climate change also affects the availability and distribution of rainfall over a location and across the season. There has been instances where growers within the same area collected significant varying amounts of rainfall. Such occurrence may cause challenges where growers share the same water conveyance system when ordering water to resume irrigation. This season, rainfall which is historically received over two to three months was collected within three weeks, which resulted in total rainfall received exceeding the LTM and 2019/20 season with one month left before the end of the season.

**Climate change effects should not be taken lightly these days as some of its effects are catastrophic. Growers are advised to be always on the alert, consider experts advice concerning extreme weather patterns and act appropriately to minimise avoidable damages.**



*Patrick Mkhalihi (Irrigation Officer) & Siphumelele Motsa (Irrigation Engineer - Trainee)*



## FROST DAMAGE ON A NURSERY FIELD

### Introduction

The extreme changes in weather patterns (climate change) which are characterized by very cold temperatures in winter as well as very high summer temperatures, severe droughts, uneven rainfall distribution and heavy storms which are at times accompanied by hailstorms are a cause for concern in the sugar industry and the country at large.

It is very unfortunate that the occurrence of these unfavourable weather events continues to threaten the sugarcane crop. Stakeholders in the sugar industry must embrace climate practices aimed at mitigating the negative impacts of the changing climate. Unfortunately some of these occurrences are beyond the growers' control.

Literature indicates that frost damage can cause severe losses in cane growth. This is because frost damages the standing cane mainly on the leaves and the growing point. Damaged leaves lead to reduced cane growth as they play a major role in photosynthesis.

### Damage in Sidvokodvo area

Frost damage at Entuthwini Farm in Sidvokodvo Area was observed in a nursery field whose seedcane was earmarked for re-planting purposes within the farm. The damage happened mid-July 2020 when the seedcane was about 10 months old. The frost caused the leaves to turn brownish in colour, with the growing points appearing severely damaged at face value. The incident was reported to both Royal Eswatini Sugar (RES) and Eswatini Sugar Association (ESA) technical advisors.

The farm was visited by ESA Crop Protection and Extension Officer for assessment.

### Advice

As shown in **Figure 2**, the top part of the seedcane stalk developed a black mark (*dead spot*) indicating

the impact of the frost damage. The buds were inspected as they play a major role in the germination of seed and luckily they looked fine. The grower was then advised to plant the seed immediately as further delays were likely to cause side shooting and rotting.

Fortunately, the grower took the advice and planting resumed late July 2020. During planting the grower was advised to be vigilant and eliminate cane stalks with side shoots and dead stalks. The emphasis was on planting good quality seed cane only. The seed germinated quite well as shown in **Figure 3**.

### Conclusion

The drive to share this experience was to help growers not disregard nurseries hit by frost at face value, instead they should do thorough inspection and seek advice before making any decision.

For more information on managing frost damaged



**Figure 2:** Frost damage on nursery field at Entuthwini Farm, Sidvokodvo



**Figure 3:** Sugarcane germinating six weeks after planting

cane, growers are referred to SASRI information sheet "4.6 Managing Frosted Cane" or contact ESATS and/or their respective Extension Officers for assistance.



*Justice Mabuza (Extension Officer - North)*