

MANAGING HAILSTORM DAMAGED CANE

Introduction

The frequent occurrence of extreme weather events is invariably associated with climate change. These extreme weather patterns relevant to the Eswatini sugar industry include very high temperatures, prolonged dry periods, abnormal rainfall distribution and devastating hailstorm. So the purpose of this guideline is to assist growers make informed decisions in the event their cane crop is hit by hailstorm.

Damage

A hailstorm event has the potential to cause severe reduction in cane and sucrose yield. A hailstorm damages the standing cane crop by causing mechanical

extent of hailstorm damage depends on the intensity and velocity of the hailstorm as well as the growth stage of the crop.

Assessing damage

SASRI Scientist, Dr Alana Eksteen, advises that growers should wait for at least five days after the hailstorm event before determining the extent of the damage on the cane. To inspect the level of damage on any growing points and any discoloration in the stalk, a representative sample of 10 to 20 cane stalks per field should be split lengthwise. It will be necessary also to check if there is any new growth on undamaged growing shoots. Leaf growth will resume as

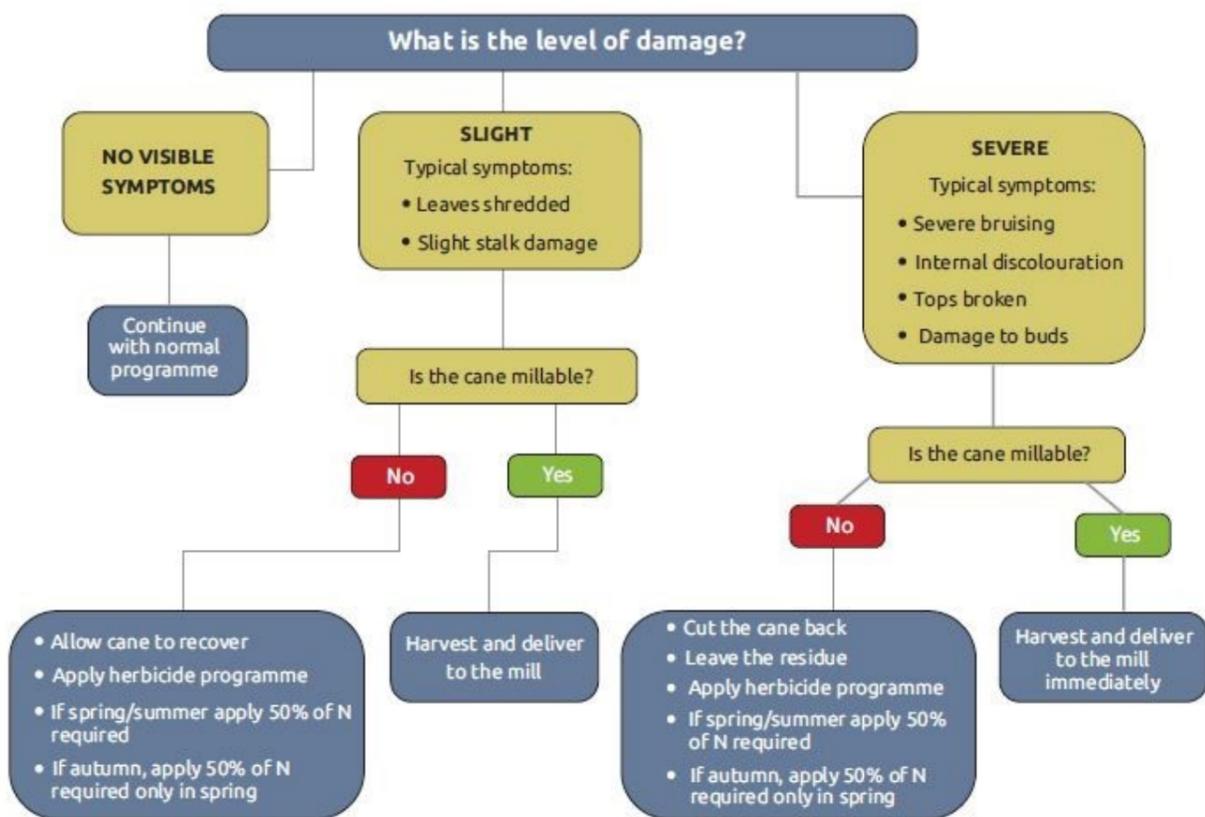


FIGURE 4: Decision tree on managing hailstorm damaged cane (Shared by Dr Alana Eksteen, SASRI)

injuries on the plants. The cane leaves are torn or shreds and most stalks are stripped of tops and trash. This damage on the leaf material results in reduced growth rate and eventually loss of yield. Young cane is reportedly the most susceptible to a long-term reduction in yield after a severe hail event. Cane stalks are bruised by hailstorms and severe damage makes it difficult for the plant to recover. Damaged cane stalks are vulnerable to fungal infections which advertently result in reduced sucrose content and juice purity. The

long as the growing point is not damaged.

To assess how hailstorm damage affects sucrose content (Suc% cane), 10-20 stalks must be sampled per field. It is necessary to split the cane stalks lengthwise and make an assessment of percentage Stalk Length Red (SLR%). The higher the SLR%, the greater the negative impact on Suc% cane. SLR% and Suc% cane are well correlated.



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"The use of Acetochlor in the industry post-December 2019 shall be prohibited"

Water saving is still key in the industry
"Proper irrigation scheduling remains key in saving water"

Hippopotamus a new sugarcane 'pest'
"The reduction in cane yield for the affected area was estimated to be around 8.3%"

Managing hailstorm damaged cane
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FAREWELL TO ACETOCHLOR

Background

Mid-2018 Flo-Cert South Africa conducted extensive audits on Fairtrade Certified sugarcane growers. Non-conformances were picked including the use of herbicides prohibited on Fairtrade products. Among the identified Fairtrade proscribed (red list) herbicides was acetochlor (chloroacetanilide). Acetochlor is a pre-emergence emulsifiable concentrate herbicide widely used in the sugarcane industry for the control of most annual grasses and certain broadleaf weeds. According to the Fairtrade classification, acetochlor is described as having a long term toxic effect on human health through chronic exposure.

Alternatives

In response, the industry advised all Fairtrade sugarcane growers to cease use of the red list chemicals with immediate effect to avoid losing their certification, and direct alternatives were recommended. For acetochlor, metolachlor (trade names: tolla 960, metolochlor 960 ec, platinum, buccaneer 960, unimoc ec) and s-metolachlor (trade names: falcon gold, palladium 960) were suggested as close alternatives. These herbicides are both pre-emergence emulsifiable concentrates used for the control of annual grasses and some broadleaf weeds. Their expected control period is similar to that of acetochlor - 8 to 10 weeks.

Rotterdam Convention

In a meeting organized by Eswatini Environment Authority (EEA) mid-December 2018, it transpired that acetochlor was being recommended for listing under Annex III of the Rotterdam Convention. Annex III of this Convention contains a list of chemicals that have been banned or severely restricted by Parties. Parties are countries that have ratified the Convention. Eswatini ratified the Rotterdam Convention on 24 September 2012 and became a contracting Party with effect from 24 of December 2012.

Prohibition

Following these developments and in line with its commitment to sustainable production, the sugarcane industry - through Council - made a unanimous decision to cease making new acquisitions of acetochlor and exhaust all available stocks thereof by

December 2019. The use of Acetochlor in the industry post-December 2019 shall be prohibited. As such, growers are advised to honour this decision and make use of the recommended alternatives. This however does not change the status of Fairtrade growers. For more information, growers are encouraged to contact their respective Extension Officers.



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SAVING WATER IS STILL KEY IN THE INDUSTRY

Improved water levels in major dams

The weather outlook released by the Eswatini Meteorological Service (EMS) in August 2018 indicated a likelihood of El Niño condition which was expected to increase severity as from January 2019. Although the severity of the El Niño condition was not so strong, but there was a decline in total rainfall received in the December-January-February (DJF) period. Table 1 shows that the total rainfall received in the DJF period was below the 2017/18 season and the long-term-mean (LTM) in two (Simunye and Big Bend) of four the meteorological stations.

TABLE 1: Dec 2018 to Feb 2019 rainfall (mm)

Met station	Season	Dec	Jan	Feb	Total
Malkerns	2018/19	160.6	140.4	166.8	467.8
	2017/18	189.1	100.0	175.0	464.1
	LTM	152.5	174.3	157.7	484.5
Mhlume	2018/19	69.8	70.0	159.8	299.6
	2017/18	72.5	78.0	117.0	267.5
	LTM	109.1	133.1	107.8	350.0
Simunye	2018/19	75.7	32.3	88.4	196.4
	2017/18	78.0	67.3	153.4	298.7
	LTM	102.0	114.1	95.3	311.3
Big Bend	2018/19	95.3	18.6	52.1	166.0
	2017/18	123.0	62.6	57.7	243.3
	LTM	98.8	95.5	77.8	272.1

The substantial rainfall received in February significantly improved the water levels in major dams used by the sugar industry as shown in Figure 1.

Prioritize water savings

Despite the improvement in water levels in major dams, water should be used judiciously so that it remains available throughout the dry season until the start of the next rain season. The EMS has also forecasted a Normal-to-Below-Normal rainfall over the March-April-May period in most areas of the country. At this time, rainfall is forecasted to be below the DJF period, hence rate of water extraction is expected to exceed that of replenishment. For that reason, saving water should continue being a priority. Proper irrigation scheduling remains key in saving water to ensure that water requirement for the sugarcane crop is met. Excess water in the soil impedes plant growth and leads to accumulation of salts. Unnecessary irrigations also result in high irrigation costs.

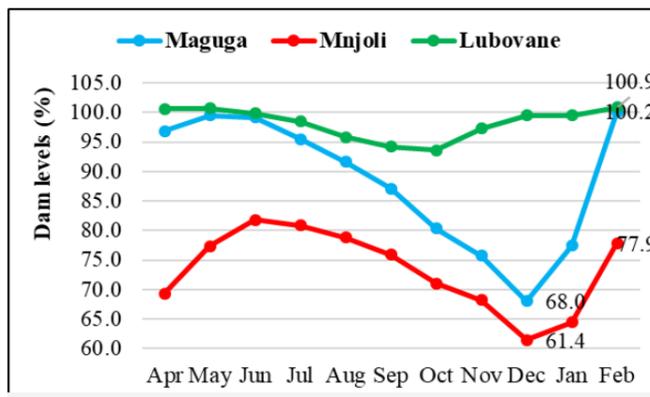


FIGURE 1: Average industry dam levels

Proper drying-off

As from March, most of the early cuts fields will be on dry-off. Proper drying-off, in addition to allowing machinery to move infield at harvesting, also helps in saving water. If growers properly dry-off their fields a certain percentage of water is saved during this period. The general recommendation is 2 times the total available water (TAW, formerly known as TAM). However, if the soil is poor draining or if rainfall is expected during dry-off (May, October to December), it is advisable to use 3 x TAW to determine the length of the drying off period. As a general guide, Table 2 shows the dry-off in weeks from May to December for the different industry soil sets. However, the determination of the correct TAW value is important in establishing the

TABLE 2: Dec 2018 to Feb 2019 rainfall (mm)

Harvest month	Total Available Water (TAW)									
	50 mm		75 mm		100 mm		125 mm		150 mm	
Soil Sets	S, De (Z,H,F)	T, K V, C	Dt, Ro		Rk, B W		Rt, L			
Deficit	2x	3x	2x	3x	2x	3x	2x	3x	2x	3x
May +	3	5	5	7	6	8	7	11	8	12
Jun	4	6	6	8	7	10	9	12	10	14
Jul	4	6	6	9	8	11	10	13	11	15
Aug	3	5	5	8	7	11	9	14	10	16
Sept	3	4	4	6	7	9	7	12	9	15
Oct	3	4	4	5	6	7	6	9	7	12
Nov	2	3	3	5	5	6	5	8	6	10
Dec	2	3	3	4	5	6	5	8	6	9

correct number of dry-off days for a specific soil and cutting month.



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HIPPOPOTUMAS - A NEW SUGARCANE 'PEST'

Introduction

A hippopotamus referred to as hippo is one of the biggest mammals in the world that spends most of its time in water. However, it often comes to land at night to feed. Of all living land animals, only the rhinoceros and elephant are larger than the hippos. They are a semi-aquatic herbivores (plant-eating), ranked as the most aggressive mammals in the world. Hippos eat, on average, 37kg of grass per day and can also eat plants that grow in the water and foliage of land plants. Usually these animals graze after sunset and can walk up to 10 kilometres looking for grass.

Hippos are becoming a problem at Vuvulane as graze on the younger cane at night when they come out of the Mbuluzi River where they spend most of their time during the day (Figure 2). A grower once found eight hippos grazing in her field at night, she tried to scare them but they would not move and she was terrified to find the animals grazing in her young cane. She then reported the incident to Hlane Game Park, who then sent rangers to access the situation and advised how the animals should be handled.

The growers were advised that the animals are aggressive and one should keep a distance from them. The rangers explained that the animals are not only causing problems to the Vuvulane growers but to most growers neighbouring the Mbuluzi River including Tambankulu Estates and RSSC. Growers also advised that these mammals do not belong to any Game Park, thus they are everyone's responsibility to protect. Hlane Game Park helps because of their expertise in handling such animals.

Impact

Given the amount of foliage that hippos consume, the damage they make on the young cane is significant. This in turn has a negative impact on the prof-

itability of the sugarcane farms. To resuscitate the damaged young cane, growers re-apply fertilizer and the costs of weed control escalate due to the delayed canopying of the crop. Estimated damage in one 3.0 ha farm was around 40% in a crop of 2.5 months of age. The grower had to re-apply fertilizer at the rate of 3.0 bags (50 kg/bag) per ha incurring additional cost of E2 520.00 to buy fertilizer for the whole field. The reduction in cane yield for the affected area was estimated to be around 8.3%.

Intervention

To keep the animals away from the field, a wire connected to a voltage or power converter can be used to keep the animals away from the field (Figure 3). The converter is used to reduce the amount of electric current going through the wire. Hippos have more fat in their skin once they touch the energised wire they will never come close to it following the electric shock. Once the sugarcane grows and have internodes the hippos cease to eat the cane. They only eat the cane when it's still at the leaf

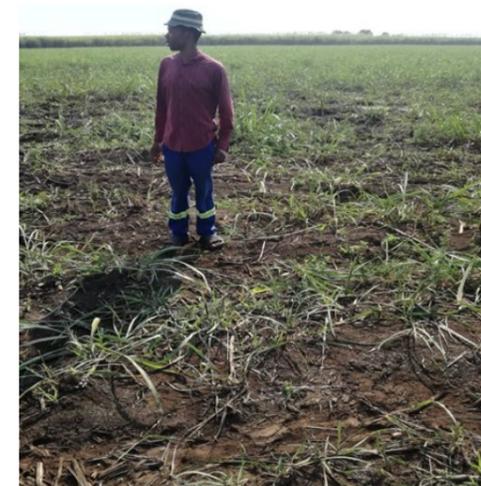


FIGURE 2: Grower assessing hippo damage on his field

stage.



FIGURE 3: Installed wire in a cane field

The animals are also reportedly scared of light and if one flashes light on them they run away. The growers sometimes guard their field with torches at night trying to scare away these animals. The growers were also advised to make trenches of 70 cm deep and 70cm wide along the field edge adjacent to the river. It is reported that these mammals cannot cross such trenches. Due to financial constraints, the affected Vuvulane growers only opted for the electrified wire and guarding their fields with torches at night. These worked even though it came after a sizeable damage had already been done in their fields.



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