SAFETY PRECAUTIONS ON KNAPSACK USE

Introduction

Applying herbicides using knapsacks is one of the important operations done to control weeds. It can be used on both flat land and sloping land. It is therefore important to remind growers to take safety measures during knapsack spraying. The following process is recommended for growers to apply in their respective farms:

1. Pre-engagement medical check-up.
2. Employee induction.
3. Issuing of correct PPE (eye goggles, overalls, gumboots, rubber gloves, rain suits and respirator). PPE should not be shared.
4. Regular safety talk.
5. Designated bathing and PPE washing area.
6. Post-engagement medical check-up.

Pre-engagement medical check-up

Knapsack operators can be employees that are working on the farm or can be employees that have been hired specifically for knapsack spraying or on contractual basis. It is important that those who are engaged for knapsack spraying are medically fit. The employees should be taken for medical check up in a clinic. Only those who will be declared fit should be engaged for the operation. Young people below the age of 18, older people above 60 years of age and pregnant women are **not** permitted to do this job.

Employee induction

Employee induction should always be done when new employees are hired. They should be shown all things that they will need during their time of work. For knapsack spraying, they should be shown change rooms, toilets, showers and areas where they will wash their PPE everyday after spraying. Figures 4 and 5 show bathrooms and chemical storeroom with the appropriate signs. Employees should be taught the meaning of all the signs during induction.

Personal Protective Equipment (PPE)

Knapsack operators should be given full protective clothing which includes overalls, eye goggles, rubber gloves, rain suits and a respirator (Figure 5). The respirator should be fitted with a cartridge. The cartridge is usually recommended to be used for three months. The PPE should be labelled to avoid sharing among employees. Having the PPE and used inappropriately is no better than not having it at all.

FIGURE 4: Bathrooms for Knapsack operators

FIGURE 5: Herbicide storeroom

FIGURE 6: Knapsack operator with full PPE

Frequent safety talk

It is important to give safety talks to employees before they start an operation. For knapsack spraying, employees should be reminded of the dangers of coming into contact or inhaling fumes of the chemicals. They should be reminded to carry the material safety data sheet (MSDS) with them at all times so that they are well informed of action to take should an accident happen.

Designated bathing and PPE washing areas

When knapsack operators have completed spraying for the day, they should bath in the designated bathing areas and wear their personal clothing. After bathing they should be allowed to wash their PPE. All PPE should be washed separately (except the cartridges) and hanged in open space to allow drying. No PPE should be taken home after spraying.

Post-engagement medical check-up.

Once the spraying season is over, the spraying team should again be taken for a post medical check up to ensure that their health is fine. If any employee is found to have contracted an occupational sickness during his/her employment, it is the employer's duty to see him/her through hospital until he/she recovers.

Conclusion

A safe and healthy employee performs duties better and improves production. It is therefore paramount that safety is given priority in all aspects of the sugarcane growing business. The practise of safety talks before starting any work should be endorsed by all as we work towards zero accidents in our workplaces.

Mandla Mbuli
(Extension Officer -South)

SWAZILAND SUGAR ASSOCIATION TECHNICAL SERVICES

EXTENSION NEWSLETTER

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Spring is here – what does it mean to a Grower?

Introduction

According to meteorological seasons, winter runs from June to August while spring runs from September to November. Winter is characterised by low temperatures, rainfall, radiation, daylength and evapotranspiration (Figure 1). In a typical year, these climatic factors pick-up in spring and reach maximum levels in summer before descending again in autumn. These changes have a tremendous effect on crop growth and its management. This article seeks to draw growers' attention to some critical farming aspects which they need to seriously consider as they step into Spring.

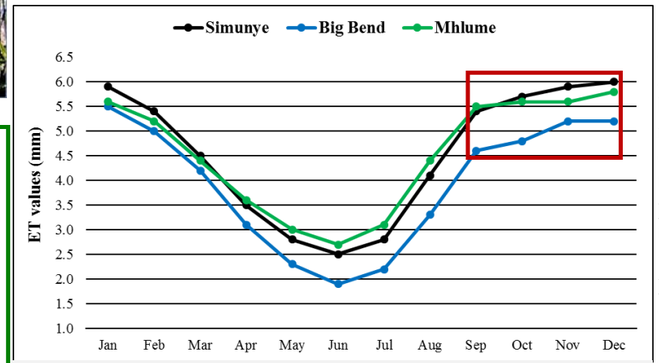

FIGURE 1: Average LTM of crop water demand for the Lowveld. Spring period is delineated by red box

Replanting

There is a sizeable amount of replanting that occurs in spring compared to autumn within the sugarcane industry largely due to favourable climatic conditions. Secondly, growers prefer the Spring replant 'window' because they do not have to skip any milling season for replanted fields. Growers are encouraged to ensure that they are adequately resourced (e.g. machinery, equipment/hand tools, labour, fertilizers, jeyes fuid [or equivalent] etc) for the replanting operation; healthy and ESA certified seedcane is secured; and irrigation infrastructure/equipment is in good condition. Seedcane should be planted, covered and irrigated immediately to avoid desiccation. The target should be to complete all planting before the onset of heavy rains. [Where possible, growers are advised to harvest plant cane fields before heavy spring/summer rains]. Waterways should be adequately constructed and grassed to minimise soil losses.

Crop nutrition

Crop growth rate is expected to increase at the onset of spring hence application of recommended fertilizers should be done on time. The general practice is to ensure that first fertilizer split (N-P-K) is applied within a week after harvesting and second split (N) is applied in July/ August for early cut fields, and six to four weeks after harvesting for mid and late cut fields. Growers on drip irrigation have some flexibility in applying the subsequent splits. Any delays in applying fertilizer may result in huge penalties on cane yield. To avoid loses, especially N, fertilizer must be watered into the soil immediately after application.

Weed control

Warm temperatures provide favourable conditions for proliferation of weeds - grasses and watergrasses in particular. Growers are therefore encouraged to put together meaningful weed control programmes and move-in on time with recom-

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SPRING IS HERE ... CONT.

-mended herbicide mixes to avoid run-away/out-of-control situations. For the long-term control of persistent grass weeds like rottboellia, sorghum and panicum, at the latest, they should be treated before producing seeds. Cynodon should be treated before spreading to other areas of the field. Multiple sprays may be required to achieve a complete eradication of cynodon. Watergrasses should never be left unchecked, they can have a tremendous negative effect on crop growth. For more information on the control of problematic weeds, growers are advised to contact their Extension Officers and or refer to previous Newsletters (Number 65 and 66) available on ESA website – www.esa.co.sz.

Smut control

Smut strives under warm weather conditions. Recent field survey results have shown that this disease has since found its way to varieties previously known to be resistant. As such, growers are encouraged to draw smut inspection and roguing programmes that include varieties that have intermediate resistance/susceptibility i.e. N25, N36, N41, N46, M1176/77. The target should be to remove infected stools as early as possible before whips appear at the apex of the culms. For smut identification and control, growers are encouraged to enlist the services of their Extension Officers. The Crop Protection section of ESATS offers practical smut identification trainings at the request of growers.

Irrigation management

With the rise in temperature and radiation, the crop water demand is expected to follow the same trend. In other words, the frequency of irrigation cycles is expected to be higher in spring compared to the winter season. To ensure optimum yields, water should be applied at the right time and in right quantities. This can only be achieved by maintaining accurate irrigation scheduling records. [For more information on available irrigation scheduling tools, growers are referred to the Irrigation section of ESATS]. Under application of water (under-irrigation) undermines the yielding potential of the sugarcane crop while over-irrigation leads to water wastage, building up of salts in root zone, increased irrigation costs, anaerobic soil conditions and subsequently reduction in yields. Reversing negative effects of persistent over application of water in the soil is a daunting task associated with overwhelming costs. The saying 'prevention is better than cure' fits perfectly for such circumstances.

Harvesting

Under high temperatures, burnt and or cut cane quality deteriorates fast. With the profuse flowering of cane experienced this season, high temperatures will accelerate side-shooting resulting in loss of sucrose. Growers are therefore encouraged to minimise burn to crush delays and harvest all flowered cane by September.

Njabulo Dlamini
(Agronomist)

IMPROVING PERFORMANCE OF SPRINKLER IRRIGATION SYSTEMS

Introduction

Most growers in the Eswatini sugar industry irrigate using the sprinkler irrigation system. Good performance of the sprinkler irrigation system largely depends on ideal operating sprinkler pressures. Most sprinkler irrigation systems are designed with an ideal operating pressure of about 350kPa at the nozzle. Recent sprinkler irrigation system evaluations in small-scale grower farms show that most were below the ideal sprinkler pressure of 350kPa, with a few exceptions of high sprinkler pressures. Low sprinkler pressures reduce the amount of water applied in a field. Figure 2 shows an example of an evaluated sprinkler field which was supposed to apply 52mm in 12 hours stand time, but due to low pressures (average of 145kPa) the sprinklers were applying on average 35mm. In fact, there was no single sprinkler in the field that was able to apply the design amount of 52mm in 12 hours. This shows the need for growers to improve sprinkler operating pressures in order to realise good performance of their irrigation system.

Causes of low sprinkler pressures

Low sprinkler pressures in most of the evaluated small-scale farms were caused by poor irrigation practices. Few cases were caused by poor designs. There were four common causes of the low sprinkler pressures that were identified in the evaluated sprinkler fields:

1. Increased number of sprinklers in a field

Most of the evaluated farmer fields had more sprinklers than the design requirement. Some of the extra sprinklers were irrigating other crops as well as supplying water to other users. The high number of sprinklers make pumps fail to meet the water requirement of the field due to low pressures. Growers are advised to ensure that sprinklers in each field are as per the designs.

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IMPROVING SPRINKLER SYSTEM... CONT.

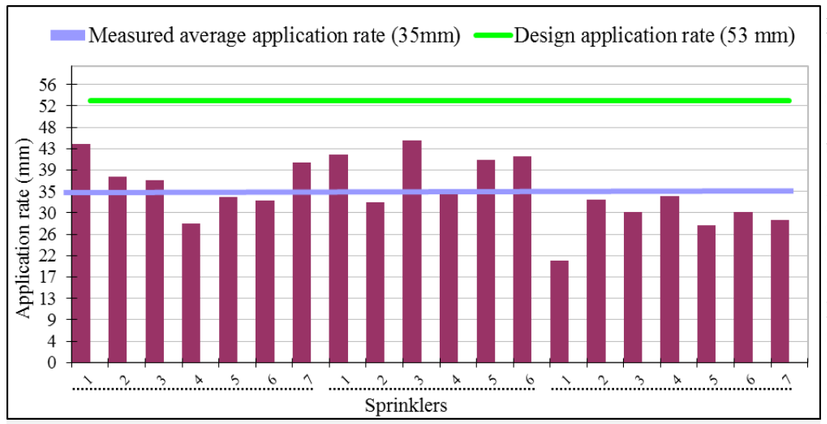

FIGURE 2: Poor application rates of a sprinkler irrigation system due to low pressure

2. Leaks

Most of the evaluated farms had leaking lateral pipes, hydrants, sprinkler hose pipes and sprinkler heads. Leaks reduce sprinkler pressures and may cause drainage problems in the long run. To improve performance of the sprinkler irrigation system, growers should always check for leaks and fix them as soon as they are identified. Worn out equipment should also be timely replaced because they easily break thus contribute to unnecessary leaks.

3. Poor quality of irrigation water

Dirty irrigation water contains sediments that clog and wear-out nozzles. Sediments in pipes clog hydrants thus lowering the operating pressure of the sprinklers. Performance of the sprinklers can be improved by flushing using the scour valves after each irrigation event. This practice is very critical for growers pumping water directly from river straight to the fields. Flushing helps reduce accumulation of dirt in the sprinklers. However, it is more effective if there is sufficient pressure in the submain. Keeping the required number of sprinklers in a field is also important in flushing as it ensures that the pressure is not unnecessarily reduced. Checking and measuring sprinkler pressures is important for effective flushing. Also, suction sump should always be kept clean to avoid debris being pumped into the irrigation system.

4. Poor design and/or poor installation of the irrigation system

Pump valves in some of the evaluated farms were throttled in fear of pipe burst either because the irrigation system was poorly designed or wrong class of pipes were installed. Growers with such problems are encouraged to redesign their irrigation systems in order to improve the performance of the sprinkler irrigation systems. Throttled valves do not only lower the pressure but also add to high electricity usage. This can cause a farm to suffer a double loss - high electricity costs and low yields due to inadequate irrigation water applied by poor performing irrigation system in the field. If an irrigation system is well designed, there should be no limit in opening pump valves unless some fields are on dry-off.

How can a grower measure sprinkler operating pressure?

Since sprinkler pressures are key to good uniformity and application rates in a field, it is important that growers are able to check and monitor sprinkler pressures of their irrigation system. It is important to keep sprinkler pressure around the ideal pressure of 350kPa. Growers can measure sprinkler pressures using pressure gauges fitted with pitot tubes (Figure 3). The point of the pitot tube should be held about 2mm in front of the nozzle opening or sprinkler water jet. The pressure of the sprinkler is measured at a height of about one metre above the ground. Since a sprinkler riser is about 3m, then 2m (or 20kPa) must be subtracted from the pressure recorded from the pressure gauge reading, in order to get the actual sprinkler operating pressure at normal operating height of 3m.

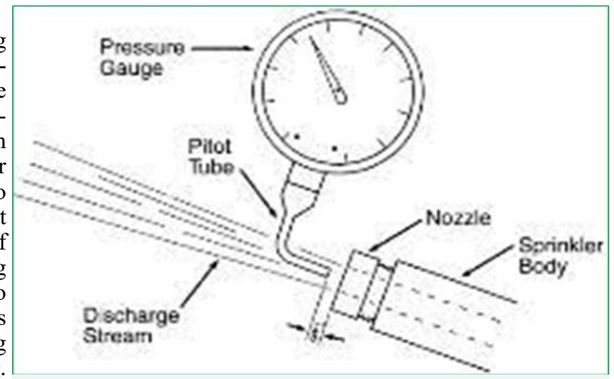

FIGURE 3: Sprinkler pressure measurement using pressure gauge fitted with a pitot tube

For more information, growers are encouraged to liaise with their Extension Officers or directly with the Irrigation section of ESATS.

Patrick Mkhaliphi
(Irrigation Officer)