

- Better seedbeds. With no compaction damage, less cloddy seedbeds can easily be produced with very little loss of moisture.
- The ability to use minimum and zero tillage systems without the inherent problem of surface compaction (in the top 10 cm).
- Improved crop yields. Research and practice have shown that yields from controlled trafficked soil are 9-16% greater than where wheel compaction is present.
- Improved soil structure.
- Improved field efficiency.
- More reliable field access.
- Increased potential and accuracy for global positioning systems.

Improved environmental conditions are brought about by:

- Improved fertilizer use efficiency. Research from around the world has shown that the uptake of fertiliser is improved by around 15%.
- Potential to retain more organic matter and soil living organisms more so with green cane harvesting.
- Improved water storage.
- Improved gaseous exchange.

Challenges

Challenges of CTF include the following:

- Designing the machinery system around existing mechanisation
- Introducing and maintaining the soil-based wheelways, particularly in areas of high rainfall.
- If mouldboard ploughing is the principal annual cultivation, the challenge is in making the switch to a non-inversion or zero tillage system.
- There is greater reliance on sophisticated technology in the form of satellite guidance and auto-steer.
- The cutting width of harvesters for example, may not match the cultivated line widths.
- Once a field has been laid out with a controlled traffic farming system, it is not advantageous to change it. However, it is not impossible because only around 20% of the field may be compacted and the position of these strips is known.

Controlled Traffic Farming at Canterbury and Tambankulu Farms:

Some of the farms implementing CTF in Swaziland include Canterbury and Tambankulu.

Canterbury Farm is situated in the Big Bend area near Nsoko. The farm has part of the area under controlled traffic. Cane is planted at 2 metre inter-row tramline spacing. All field equipment were adjusted to 2 metre wheel tracks. At Tambankulu, cane is planted in 1.8 metre rows tramline. The infield machinery are fitted with high floatation tyres which greatly minimize compaction in the designated infield wheel ways.

Future

Although controlled traffic farming is still in its infancy as far as adoption is concerned (partially because the enabling technology of satellite guidance is still relatively new), there are indications that it will increase in the future considering the benefits reported by farms that have implemented it.

By Noah Dlamini (Irrigation Engineer)

TOPICAL TIPS

Winter Irrigation

Cool months do not negate the necessity of irrigation scheduling. Irrigation scheduling is equally important even at this time of the season. Remember that the cost of energy (electricity) is normally high during the winter months. So you do not want to destroy your crop and soil by over-irrigating whilst paying unnecessarily more for electricity consumption.

Pests and diseases

Growers are encouraged to keep an eye on eldana. It is recommended that fields with high eldana levels be harvested earlier than eldana free fields. This is equally important when planning to carry over some of the cane fields. Remember variety N26 is highly susceptible to eldana and it must not be carried over.

Flowering

Variety N23 flowers profusely relative to other industry varieties. It is thus recommended that N23 fields be scheduled for harvesting prior to mid-October. Growers intending to engage late ripening are reminded that it is not recommended to spray a field that has flowered 25% or above.

By Njabulo Dlamini (Crops Agronomist)



EXTENSION NEWSLETTER

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CHOICE OF VARIETIES

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Controlled Traffic Farming (CTF) Issue

Innovations in sugarcane production

SSATS continues to look for other technologies which could be used in the production of clean, true to type and pest and disease free seedcane.

Introduction

Spring replanting is just around the corner. The greatest decision already made by cane growers (CGs) is the choice of cane varieties.

It must be emphasized that choosing the right variety for the different conditions faced by growers transcends personal choice. It is an economical decision. The number of varieties available from which growers can choose from has really increased compared to ten years ago, courtesy of SSA – SASRI agreement.

Variety categories

For the purposes of proper variety control, varieties in the industry are classified into two categories: category 1 and category 2. Category 1 varieties are: NCo376, N14, N19, N23, N25, N26, N36 and N40. These varieties were released for propagation to local growers following rigorous evaluations in different soils and harvesting periods. Category 2 includes N32, N41, N43, N46, N49, N53, M1176/77, M1400/86, M1551/80 and M96/82. Category 2 varieties are still being evaluated for possible release to all CGs. However, large scale growers (≥1000 ha) are encouraged to plant these varieties at a smaller scale to complement SSATS variety trials.

Prior to ordering seedcane, growers are encouraged to consider their own growing conditions (especially soil and harvesting cycle). Varieties perform differently under different environmental conditions. Consulting area Extension Officers (EOs) before choosing a variety is very essential. Annexure 1 is

a summary of the current variety recommendations. However, Malkerns growers are not permitted to grow NCo376 and N19 due to high smut and mosaic susceptibilities, respectively.

Early season

For early season (April - July) cut cane, growers are advised to consider higher sucrose content varieties (N26, N36 and N40). During this season the crop has just passed through a period of stalk elongation owing to growth favouring conditions. Unfortunately, sucrose content is inversely proportional to stalk elongation. Thus it is essential for growers to choose varieties that are relatively high in sucrose content. However, the cane yield should not be ignored. Ideally, the variety should be high in sucrose content and average to above average in cane yield. To reap the benefit, the cane must be harvested when fully matured.

Secondly, varieties that respond exponentially well to chemical ripeners should be considered for this time of the season (NCo376, N23). This is even more applicable to growers whose farms are a long distance from the mill. Thus, it calls for a greater balancing of cane yield and sucrose content.

Mid-season

Mid-season (August - September), is the period where most varieties have accumulated over 95% of potential sucrose yield. Vegetative growth is very minimal in favor of sucrose accumulation in cane stalks. Mid-season is not too segregatory since some varieties performing well either early or late season also thrive during these months.

CHOICE OF VARIETIES (CONTINUED)

Late season

For late season (October - November) harvesting, growers are encouraged to consider high cane (tons) yielding varieties (e.g. N25, NCo376). These are varieties that give high cane tonnage and average to above average sucrose content. Between September and October, mature cane reaches maximum sucrose content. As this period progresses, conditions favoring cane growth pick up reducing the cane – sucrose ratio. To counter this effect, some growers apply chemical ripeners, a practice which is encouraged by SSATS. However, growers should note the cane juice purities before spraying. Ideally, juice purity should be less than 85% for cane to effectively respond to fusilade.

By Njabulo Dlamini (Crops Agronomist)

INNOVATIONS IN SUGARCANE

Tissue Culture

In previous issues of this newsletter, articles on innovations in sugarcane production were published. One of these was sugarcane production using tissue culture plantlets. The involvement of the industry with tissue culture was for the purposes of producing true to type, high vigour and pest and disease free seedcane. However, soon after venturing into tissue culture, the supplier of the plantlets closed down operations and the whole project was thrown into disarray.

SSATS searched for other suppliers and found one at Dube Tradeport in Durban. This supplier was venturing into tissue culture for the first time and had just signed a memorandum of understanding (MoU) with the South African Sugar Research Institute (SASRI) in November 2012. Operations are now in full swing in this company.

The latest update from SASRI is that they are taking this venture which is strategic to the industry towards producing clean, pest and disease free seedcane seriously so that they are considering doing it themselves. However, a business plan for this is still going to be developed and will require engagement of the SASRI Committee and once in place will require Council approval. Once approved, the project will take 14 months to complete indicating that full production could possibly start around 2016. Between now and then, it seems like the industry will

have to continue searching for other ideal alternatives. Alternatively, the industry could look at working with Dube Tradeport in the interim, even though fears of sudden closure for whatever reason still haunt the industry.



Green house hardening

Plene Technology

SSATS continues to look for other technologies which could be used in the production of clean, true to type and pest and disease free seedcane. One of the recent advances in sugarcane production is the Plene planting technology from Syngenta. The Plene system, first announced in 2008, has been going through proving trials in Brazil since then and it was expected to be ready for commercial launch in 2011 but this has not happened to date as its refining is still on-going.

Plene Technology

INNOVATIONS IN SUGARCANE (CONTINUED)

The Plene system is based on the production and planting of sugar cane segments, or buds, which are less than four centimetres in length compared to the conventional setts of 30 to 40cm. They are pre-treated with specific seed treatment technologies and other protectants maximising early plant development. Sugar cane seedlings produced by the *Plene* system also offer the opportunity for greater varietal purity and ultimately better traceability using fingerprinting technologies.

There are also significant management and environmental benefits. Planting costs, using adapted seeders, are estimated to be 15% lower per hectare than conventional methods. The simpler and quicker planting system can provide the option of minimum cultivation and the benefit of quicker turnaround from harvest to re-planting. So growers can harvest and replant sugar cane more frequently, and thereby increase their annual yields by 5 to 20% per hectare.

Latest on Plene Technology

Dr. Manuel Sainz of Syngenta was contacted to find out whether this technology was ready and available for use in the sugar industry. The response obtained was that at the moment this technology is only available in the Brazilian market, where it is being refined prior to launching in additional markets. It was suggested that SSATS should follow up with Syngenta in a year or two to get an update on developments. SSATS will keep abreast on the developments of this technology.

By Duma Zwane (Crop Protection & Extension Office)

CONTROLLED TRAFFIC FARMING

Introduction

Adoption of sound management practices is important in sustainable sugarcane farming. Controlled traffic farming (CTF) is one practice that is showing positive spin-offs on those growers that are using it. A few farms in the Swaziland Sugar Industry practice controlled traffic farming.

The basics of CTF

Controlled traffic farming is a management tool which is used to reduce the damage to soil caused by heavy or repeated agricultural machinery passes on the land. This damage and its negative consequences include reduced crop yields and poor soil function in terms of water infiltration and drainage. Controlled traffic farming is a system which confines all machinery loads to the least possible area of permanent traffic lanes. Most current farming systems allow machinery to run at random over the land, compacting most of the area by the second season. Soils don't recover quickly. A proper CTF system on the other hand can reduce tracking to just 15% and this is always in the same place. The permanent traffic lanes are normally parallel to each other and this is the most efficient way of achieving CTF, but the definition does not preclude tracking at an angle

Controlled traffic farming can be achieved on any scale but to get tracked areas to the minimum possible, there are three requirements: (1) To match implement widths so that adjacent passes are in the same place for all machines working in the field; (2) To match the track widths (the distance between wheel centres on the same axle) of all field machinery; and (3) To keep machinery in exactly the same place year in year out.

Keeping machinery in exactly the same place is most easily achieved with a satellite guidance system to ensure the vehicles pass in the same place year in year out and it also achieves the highest pass to pass accuracy of around ± 2 cm.

Advantages of CTF

There are many benefits associated with CTF and they help to deliver the two most important factors in farming operations – increased profits and improved sustainability. These are delivered by improving soil health, which in turn lowers costs and increases crop returns but it also results in improved environmental conditions. The main advantages of CTF are:

- Improved crop yields, particularly in seasons with extreme dry or wet conditions.
- Lower energy for driving over the soil.
- Lower machinery investment.