StalkGro

USER MANUAL

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September 2017

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A. INTRODUCTION

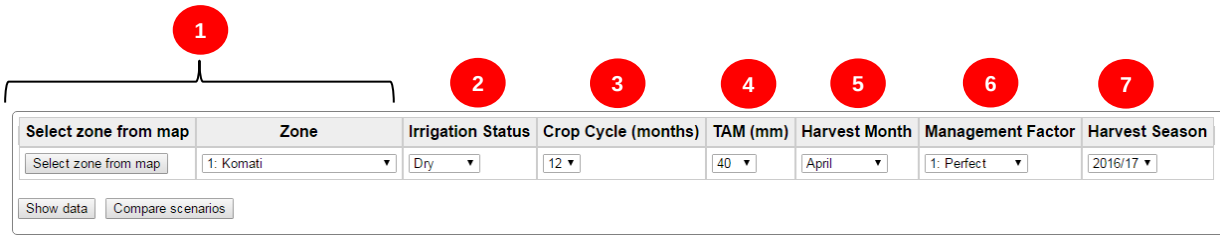
StalkGro has been developed for use in the South African sugar industry. It can be useful when conducting sugarcane yield estimation, mill planning, harvest scheduling, carryover field selection or chemical ripening.

It estimates monthly cane and sucrose yield increments for a particular homogenous climate zone by using information about the crop's irrigation status, TAM, crop cycle and harvest month.

The program makes use of a pre-generated dataset that was compiled using the DSSAT v4.5 Canegro Sugarcane model.

The application is available on the SASRI website: www.sugar.org.za/sasri.

B. DESCRIPTION OF INPUT OPTIONS



1. Homogenous Climate Zone (HCZ)

The SA sugar industry has been divided spatially into 48 Homogenous Climate Zones, with each zone having reasonably similar climate. If you know your HCZ, select it from the drop down list. Alternatively, select it from the map.

2. Irrigation Status

Select the irrigation status of your farm: either '**Dry**' for a non-irrigated farm or the irrigation percentage that most closely matches the level of irrigation being practised.

3. Crop Cycle

Select your crop cycle (growing period). This will be the age (in months) of the crop at harvest, and not the current age.

4. Total Available moisture (TAM)

TAM represents the maximum water holding capacity of the soil in your field. Select a TAM figure that most closely matches the TAM of your fields.

5. Harvest Month

Select the month in which your current crop will be harvested. Available options are based on the South African sugar industry milling season.

6. Management Factor

Select a Management Factor. This is an adjustment factor used to render the estimated yields more realistic.

Simulated results assume perfect management, and may have been created using conditions slightly different from yours. Over time, you will need to compare DSP estimates of final yields with your actual yields in order to determine an appropriate management factor.

Generally, 100% represents experimental conditions, 80-90% very good, 60-70% are the average for the industry.

7. Harvest Season

Select the harvest season.

Once you have completed all the inputs, click on '**Show Data**' to view the results.

The '**Compare Scenarios**' button cane be used for an on-screen, side-by-side comparisons of two different scenarios.

C. UNDERSTANDING RESULTS

1. Example

In the following example, the scenario is of a dryland (i.e. no irrigation) farm in the Mtubatuba Homogenous Climate Zone (HCZ). The crop is grown on a 12-month cutting cycle on soils with a TAM of 120. The crop will be harvested in May 2018.

The user will make the following input:

Select zone from map	Zone	Irrigation Status	Crop Cycle (months)	TAM (mm)	Harvest Month	Management Factor	Harvest Season
Select zone from map	13: Mtubatuba	Dry	12	120	May	0.7: Good	2017/18

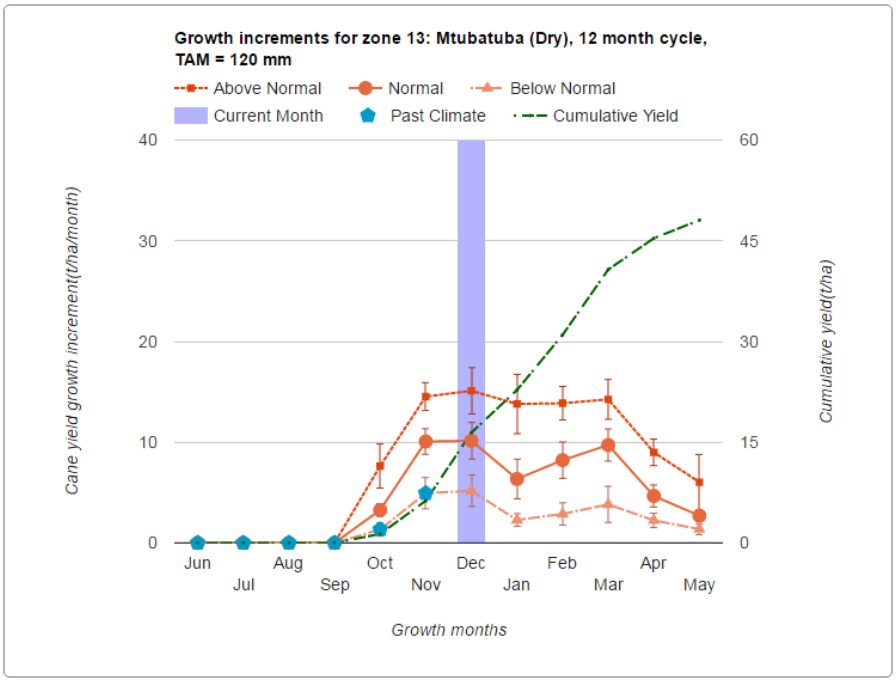
Show data | Compare scenarios

Upon selecting '**Show data**' the following results will be displayed.

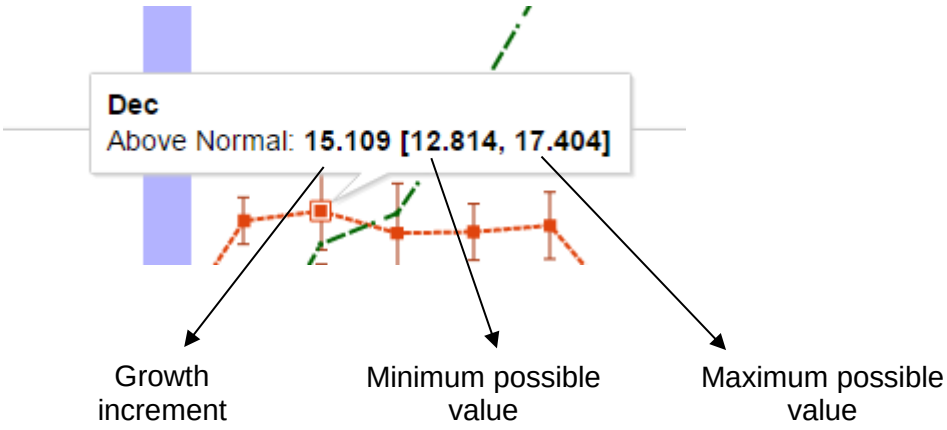
2. Cane Yield Graph

The cane yield graph shows yield for three climate scenarios: below-normal, normal and above-normal.

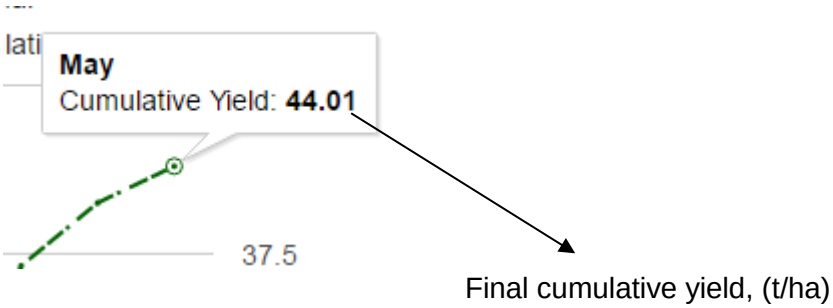
It also shows the cumulative yield (tons cane per hectare) that you can expect at any point in the growth cycle of the crop. Cumulative yield is calculated by adding growth increments based on actual climate in the past months since the start of your crop (highlighted by blue stars) and by assuming normal climate in the coming months until your crop is harvested. If no climate data are available for the past months since the start of your crop, normal climate conditions are assumed for those months.



Clicking on any point in the graph will show you more detailed increments, i.e. it will show you the exact increment value together with the minimum and the maximum possible values for that month shown in brackets.



Clicking on last point in the “Cumulative yield” line will show you what the cumulative yield per hectare should be at harvest.



3. Cane Yield Table

All data shown in the graph above is presented in table format in the Cane Yield table. The data in the table can be downloaded as a Comma-Separated Values (CSV) file for analysis in Excel (or a similar program). The growth rates for above-normal, normal and below-normal climate conditions are shown together with the standard deviations shown for each category.

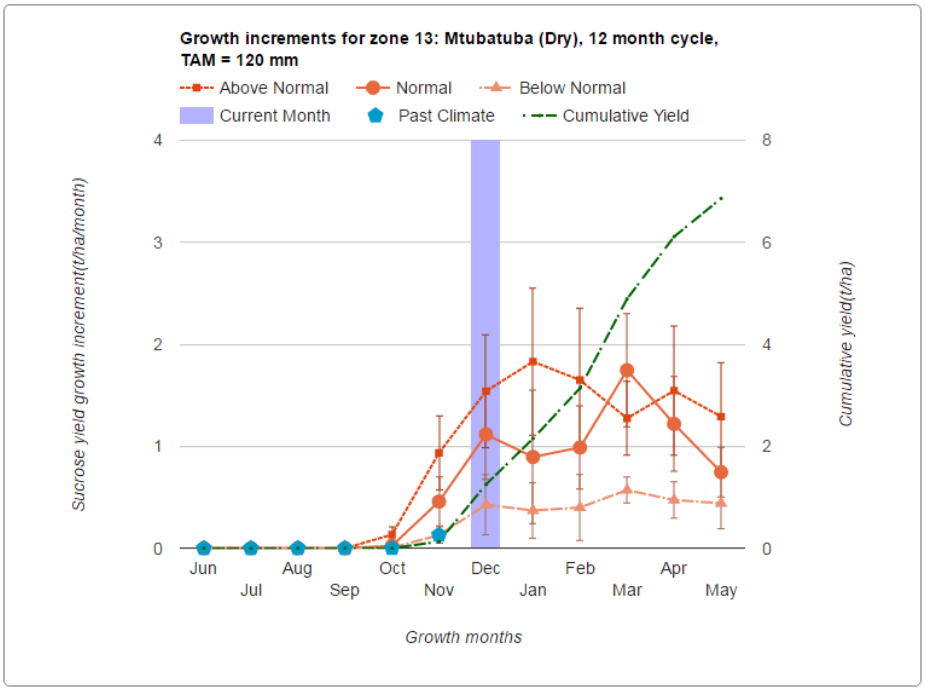
Cane Yield:
Above-normal, normal and below-normal simulated monthly cane yield growth rates (t/ha/month), and standard deviations thereof.

Growth Month	Above Normal (AN), t/ha/month	Std. Dev. (AN)	Normal (N), t/ha/month	Std. Dev. (N)	Below Normal (BN), t/ha/month	Std. Dev. (BN)
Jun	0	0	0	0	0	0
Jul	0	0	0	0	0	0
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
Oct	7.6	2.2	3.3	0.6	1.3	0.7
Nov	14.5	1.4	10.1	1.3	4.9	1.6
Dec	15.1	2.3	10.2	1.8	5.2	1.6
Jan	13.8	2.9	6.4	2.0	2.3	0.6
Feb	13.9	1.7	8.2	1.8	2.9	1.1
Mar	14.3	2.0	9.7	1.6	3.8	1.8
Apr	9.0	1.3	4.7	1.1	2.2	0.7
May	6.0	2.8	2.7	0.6	1.4	0.5

Download CSV file

4. Sucrose Yield Graph

The sucrose yield graph displays information in a similar fashion to the cane yield graph.



Here also, clicking on any point in the graph will show you more detailed increments, i.e. it will show the exact increment value together with the minimum and the maximum possible values for that month shown in brackets. Clicking the last point on the **Cumulative Yield** line will show what the cumulative yield per hectare should be at harvest.

5. Sucrose Yield Table

The sucrose yield table contains the data shown in the graph above it in tabular form. The data in the table can be downloaded as a Comma-Separated Values file for your own analysis. The growth rates under above normal, normal and below normal climate conditions are shown together with the standard deviations for each category.

Sucrose Yield:
Above-normal, normal and below-normal simulated monthly sucrose yield growth rates (t/ha/month), and standard deviations thereof.

Growth Month	Above Normal (AN), t/ha/month	Std. Dev. (AN)	Normal (N), t/ha/month	Std. Dev. (N)	Below Normal (BN), t/ha/month	Std. Dev. (BN)
Jun	0	0	0	0	0	0
Jul	0	0	0	0	0	0
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
Oct	0.1	0.1	0.0	0.0	0.0	0.0
Nov	0.9	0.4	0.5	0.2	0.1	0.1
Dec	1.5	0.6	1.1	0.4	0.4	0.3
Jan	1.8	0.7	0.9	0.7	0.4	0.3
Feb	1.6	0.7	1.0	0.4	0.4	0.3
Mar	1.3	0.4	1.7	0.6	0.6	0.1
Apr	1.5	0.6	1.2	0.5	0.5	0.2
May	1.3	0.5	0.7	0.2	0.4	0.3

Download CSV file

D. COMPARING TWO SCENARIOS

The system makes provision for comparing scenarios – the ‘compare’ button creates and displays a second instance of the user interface, and initialises this with the current user inputs. The user can then modify the inputs as necessary and compare results side-by-side.

This could, for example, be used to assess the implications of carrying over a field, as follows:

1. Set up the scenario using harvest cycle, harvest month and harvest season information as if the crop is not being carried over.
2. Select ‘Compare Scenarios’
3. Change the harvest cycle by adding the appropriate number of months.
4. Change the harvest month
5. Change the harvest season (if necessary)

The resulting graphs and tables will allow you to compare the yield difference two scenarios.