



FruitLook December 2014: An Insight in FruitLook Data Validation Research

Dear Mr. Doe,

FruitLook is currently running for the 4th season in a row. In these past seasons scientific research and practical application gave insight in the way FruitLook can improve sustainable resource management on farms. Based on these experiences it is clear FruitLook can be used, among other things, for better identification of disease affected areas, determination of soil moisture probe placement location and evaluation of irrigation systems/scheduling. Progress with data applications development will be discussed during the FruitLook Forum this Wednesday (December 3rd) at Elsenburg (registration for this event is closed).

At the upcoming FruitLook Forum representatives of the fruit and wine production sectors have an opportunity to meet, get informed and discuss FruitLook. During the FruitLook Forum also results of validation research performed on the FruitLook dataset will be shared with the attendants. Since the start of GrapeLook in 2010, which is the predecessor of FruitLook, validation research has always been an important part of the project. In this newsletter some of this validation research is brought to the spotlight.

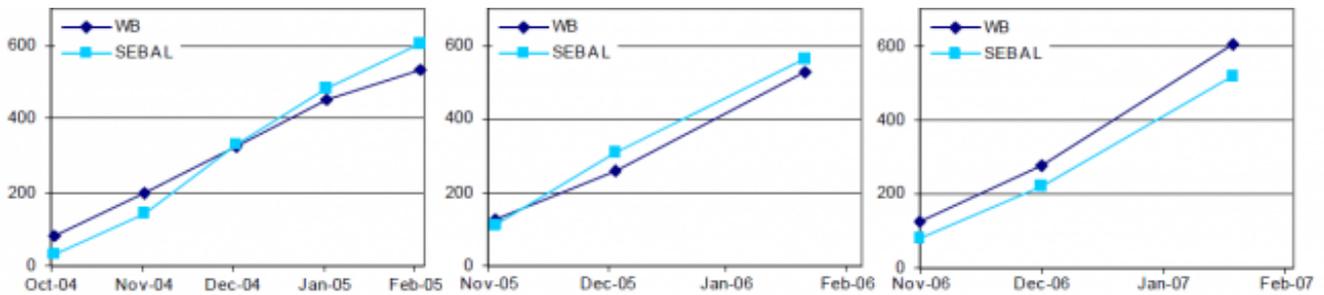
An Insight in FruitLook Data Validation Research

For FruitLook to be successful it is critical that the data provided is accurate. A number of users have highlighted the importance of evaluating the quality and hence accuracy of the various data products provided. Over the years a number of institutions have been involved in data validation including the CSIR and more recently the University of KwaZulu-Natal, Stellenbosch University and independent researchers. Researchers have evaluated the accuracy of the data, specifically the evapotranspiration, evapotranspiration deficit and biomass production estimates. A number of students at MSc and PhD level are involved in the research as well. Data assessment is done in both a qualitative (trends analysis of the spatial data) and quantitative (actual values comparison) way.

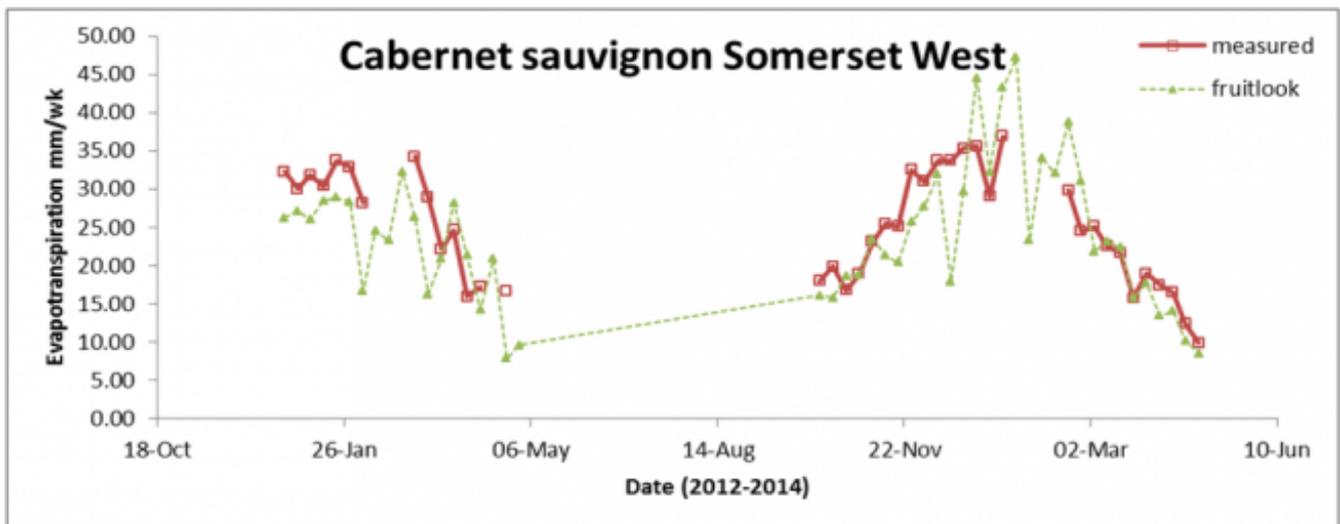


Even prior to the initiation of FruitLook a number of fields have been studied (table grapes in the Hexriver Valley and wine grapes in the Paarl area) to ensure validity and accuracy of the algorithms used to calculate the FruitLook data components. Evaluation sites represented a range of climatic conditions, crop types and management conditions

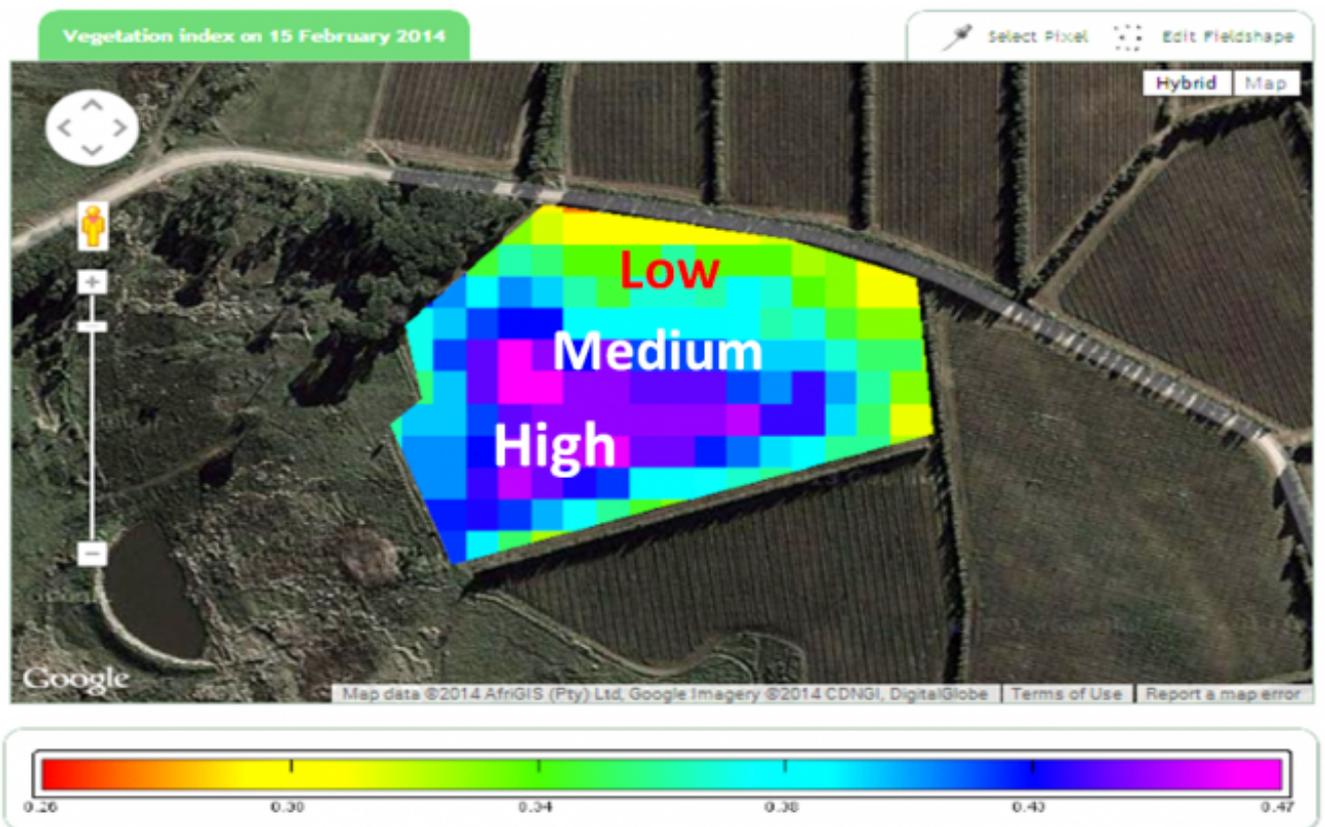
and focused on the accuracy of evapotranspiration data. In the graphs below results of this historical study are displayed. It shows the accumulated actual evapotranspiration in experimental blocks in Hexriver Valley for three succeeding seasons. The light blue curve displays accumulated actual evapotranspiration based on SEBAL calculations, the dark blue the accumulated actual evapotranspiration calculated with the soil water balance based on field experiments. The SEBAL model is the current model used to produce the FruitLook dataset (click [HERE](#) for more information on the model). Based on work conducted as part of GrapeLook, the SEBAL algorithm was correlated to better fit the conditions in the Western Cape.



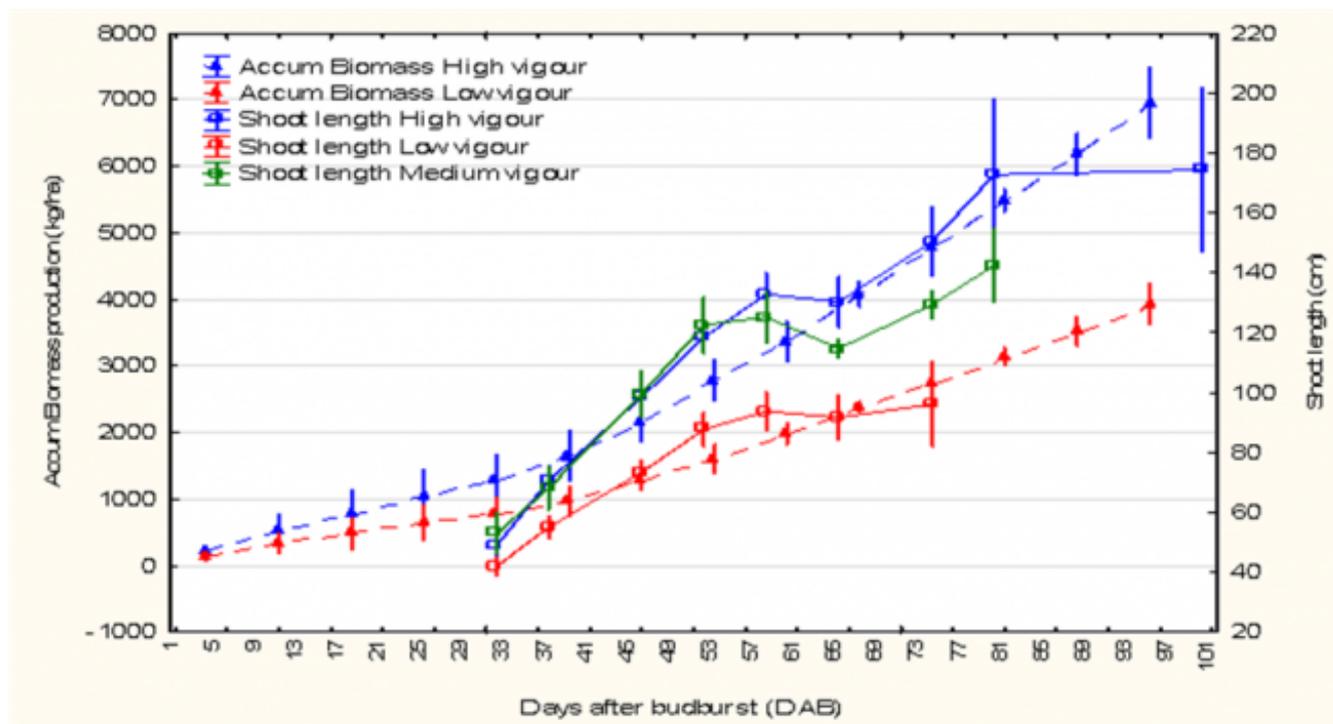
For the past and current growing seasons, a more integrated approach is followed, assessing not only the evapotranspiration data but also growth, crop phenology and stress. Field data is collected from Cabernet sauvignon and Shiraz blocks spread spatially over the FruitLook area, representing different growth conditions (low, medium and high vigour), management systems and climatic conditions (temperate to warm climates). The figure below compares the evapotranspiration measured in the field with values from FruitLook for a Cabernet sauvignon vineyard in Somerset West.



The Vegetation Index parameter (= NDVI) from FruitLook is shown for one of the vineyards studied in the image below. The Vegetation Index is an indicator for the vitality of your crop. A high index means a healthy and strong growing vegetation. FruitLooks Vegetation Index agreed well with multispectral aerial photography estimates. Below differences between low, medium and high growth vigour areas are displayed.



Similarly, shoot growth measured in the field at areas with different vigour is compared to the biomass production from FruitLook for the corresponding areas. The solid lines in the graph below show the progression of shoot length; this is displayed per area with different vigour. The dashed lines show the accumulation of biomass throughout the season based on the weekly actual biomass production parameter gained from FruitLook; this is also displayed per area with different vigour. A good correspondence can be seen between the ratio of low to high vigour biomass, indicating that the satellite data is able to convey the growth differences within vineyard blocks quite effectively; but the actual biomass data also compare well to field measurements.



An article describing an extract of FruitLook data validation, within the context of monitoring growth and water status of wine grape vineyards will be published in Wineland magazine soon (article written by AE Strever, C Jarman, TO Southey & JJ Hunter). This article is due for publication in the February 2015 edition.

Data validation is ongoing during the 2014/15 growing season and more results will be disseminated during future

newsletters and meetings. If you have questions about or want to know more of the validation research performed, or about FruitLook in general, please contact us via info@fruitlook.co.za. We hope to see you again soon on our website!

Best regards,

Ruben Goudriaan, Annemarie Klaasse and Caren Jarmain,

The FruitLook Team



Disclaimer