

FRUIT FLY AND FALSE CODLING MOTH MONITORING: Expansion in the Lower Orange River Valley

Historically, insect control has mainly made use of insecticides. More recently however, market requirements have placed stricter criteria on the use of chemicals to control insects due to their potential negative impacts on the environment. This has encouraged the development of management strategies such as area-wide integrated pest management (AWIPM) and sterile insect technique (SIT) which can be used in combination with the 'softer' insecticides still used.

By the middle of 2015, the concept of AWIPM was well recognised and had been implemented by a number of table grape producers in the Lower Orange River Valley, under the management of FruitFly Africa. These efforts, had however, not been well integrated with efforts implemented by producers of other crops in the region. This created 'gaps' in the AWIPM programme which compromised its effectiveness.

To address this, meetings were convened between representatives of the wine industry (represented by Orange River Wine Cellars), the raisin industry (represented by the Dried Fruit Technical Services), the citrus industry (represented by Citrus Research International) and the table grape industry (represented by the Orange River Producers' Association and the South African Table Grape Industry). Through the meetings the industries agreed to the following:

1. Integrate management efforts of fruit fly and false codling moth
2. Expansion of the AWIPM in the Lower Orange River Valley
3. A funding mechanism

WHAT DOES THIS MEAN?

The Lower Orange River Valley stretches for 350 km from Blouputs in the west to Groblershoop in the east, and by June 2015 $\pm 4\,500$ ha ($\pm 3\,500$ ha table grapes, ± 100 ha wine grapes, ± 50 ha raisin grapes, ± 700 ha citrus and ± 150 ha pecan nuts) were being monitored by FruitFly

Africa (FFA) for three species of fruit fly and FCM in the Blouputs, Augrabies and Kakamas areas.

The agreement reached between the industries is an expansion of this monitoring programme to monitor an additional 2000 ha of orchards/vineyards in the Kakamas area in the first phase, after which an additional 2000 ha is to be included.

A relationship between DAFF and FFA, established through a Memorandum of Understanding, makes provision for assistance from DAFF for fruit fly monitoring through a 50:50 co-funding model. This has meant that industries are able to expand their monitoring area at half the cost due to the contributions from DAFF.

Although initially the programme will focus on monitoring, the data will ultimately be used to establish a complete AWIPM in these areas. To align the complete programme with best international practice it will include the following:

- Monitoring and hot spot management;
- Fruit fly reduction programme (host plant and "hotspot" management, baiting, mass trapping, sanitation and orchard hygiene);
- Ground baiting, including "attract and kill" M3-traps;
- Aerial baiting, during the production season as well as other strategic applications;
- Monitoring and treatment of towns;
- A communication and education programme; and
- Sterile insect technique (SIT)

The programme aims to monitor for Natal fruit fly, Mediterranean fruit fly, Oriental fruit fly and false codling.

Extracted from *Area-wide management of fruit flies in the Lower Orange River (LOR)*, A scoping document, prepared by FruitFly Africa Pty. (Ltd)

FruitLook for Water Efficient Table Grape Farming

A changing climate, rising input costs and increased competition for water are challenging South African producers to attain higher yields with less water. In the Western Cape, FruitLook supports fruit and wine grape growers to do just that. FruitLook is an open access online platform to monitor vineyards and orchards, building on satellite imagery and weather information. It is currently only available to farmers in the Western Cape Province via funding from the Western Cape Department of Agriculture. During the fruit growing season weekly updates of various data sets are provided via the website which describe crop growth, associated water use and leaf nitrogen content. This data helps farmers to make more informed decisions which can lead up to 30% more efficient use of water.

What is FruitLook?

Droughts cause significant damages to agricultural produce. Climate models suggest rainfall is becoming less predictable which will increase the impact of droughts in South Africa. In the Western Cape this affects one of its biggest industries: fruit and wine production. The Western Cape Department of Agriculture acknowledges the need for more water efficient farming and for that reason FruitLook was created in 2012 in cooperation with Dutch service provider eLEAF. The grape and fruit industry is of huge fiscal importance, representing almost a third of the provinces' exports. Hence,

maximising its production while minimising the ecological impact is both of (socio-)economic and environmental importance.

Table 1: Information provided in FruitLook

Growth Parameters	Unit
Biomass Production	kg/ha
Leaf Area Index	-
Vegetation Index	-
Moisture Parameters	Unit
Actual Evapotranspiration	mm/ week
Evapotranspiration Deficit	mm/ week
Crop Factor	-
Biomass Water Use Efficiency	kg/m ³ of water
Mineral Parameters	Unit
Nitrogen content in top leaf layer	kg/ha
Nitrogen content all leaves	kg/ha

FruitLook is available in the main production areas of the Western Cape. The service provides relevant and timely satellite-based data to increase agricultural production and optimize agricultural water use. The complete dataset (See Table 1) consists of information related to biomass production (crop growth), actual evapotranspiration (crop water use) and leaf nitrogen content. From September to

April farmers can monitor overall block development per week, gain insight in the internal variation within a block and compare blocks with each other. Via FruitLook the farmer is better informed on the performance of his farm. As a result the farmer will make better decisions on farm resource management which will lead to more (water) efficient crop production.

How relevant is FruitLook for table grapes?

Commercial table grape production requires a hot, dry climate with water supplied through irrigation for optimal production. The sunny summers of the Western Cape combined with sufficient winter rainfall makes it a very suitable table grape production area. Simultaneously table grape production is particularly vulnerable to droughts. Water shortages caused by a dry winter period will directly lead to reductions in yield. This means farmers need to use their water as efficiently as possible throughout the season. This is where FruitLook can fulfil an important role.

FruitLook can help farmers evaluate irrigation management, both in quantity and distribution. Via the Evapotranspiration Deficit parameter users can determine which fields are most affected by stress throughout the season. Evapotranspiration Deficit can be caused by insufficient irrigation, leading to water stress within the crop, or atmospheric conditions of such nature (high temperature, low humidity) that the stomata close which results in the tree not transpiring optimally. Also, reoccurring trends in Biomass Production and Evapotranspiration Deficit are closely linked to variations in soil within a block. This helps users make better decisions on soil moisture probe placement and irrigation system design.

In terms of crop monitoring FruitLook can be used to determine if fields are performing optimally. Blocks can be compared spatially and through time to detect growth deficiencies. For example, disease infected blocks show on average less growth than healthy blocks. Within these infected blocks the farmer can use FruitLook to delineate the infected areas. By limiting pesticide application to these areas, resources are more efficiently used and the environment is less affected.

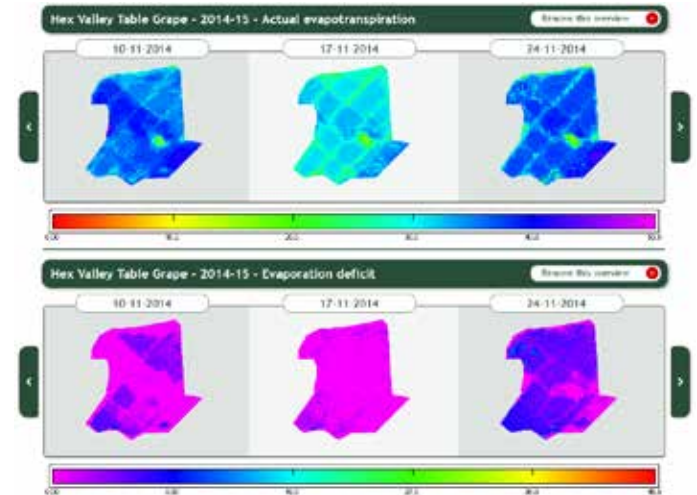


Fig.2: Fields can be compared and evaluated through time. On this picture the Actual Evapotranspiration is compared to Evapotranspiration Deficit of a table grape farm in Hexriver Valley.

What has been achieved so far?

Continuously rising numbers of website visits, user accounts and block orders indicates FruitLook has made a successful introduction in the wine and fruit production industry. FruitLook 2015-16 supports over 250 active users who access more than 20,000 hectares of satellite based information on a field by field basis. Simultaneously FruitLook triggers conscious use of fresh water supplies within the farming community. In a recent questionnaire more than half of the respondents experienced that their water use efficiency increased by 10 to 30% through using FruitLook. Most users ascribed this to improvements in irrigation system design, better soil moisture probe placement and earlier detection of over- and under irrigation.

Overall there is still much to gain in farming. Agricultural economists from the Department of Agriculture recently estimated that a saving of 10% in production costs together with an increased production of 10%, could lead to an increased revenue of (on average) R 33 858 per hectare for table grapes. FruitLook is a tool to help farmers make these next steps. And one with great potential: as it is directly available to almost every fruit and wine grape farmer in the Western Cape it can support agricultural production at an unprecedented scale.

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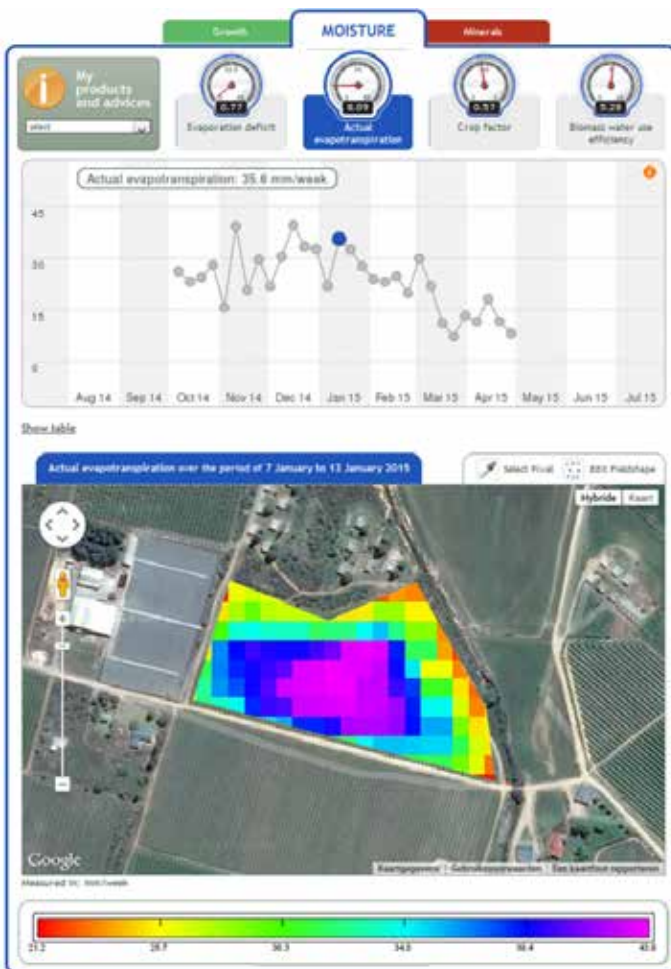


Fig.1: Block development is captured in time and space on FruitLook.