Message from the Management

Unlocking the power of custom queries

Dear Customers and Friends,

The OMP program contains a large number of built-in data analysis forms, reports and charts to help you extract useful information from your agronomic data. The big advantage of these built-in objects is that with the easy-to-use graphical user interface anybody can view the results of potentially complex underlying calculations, without needing to know anything about the underlying programming and query-writing languages. While we constantly add new data analysis features based on requests and ideas from our customers, it is clearly impossible to cover every eventuality and every plantation will have some specific individual questions or reporting requirements that might not (yet) be covered by the built-in OMP reports. In these cases it can be very useful to be able to by-pass the OMP user interface and work directly with the underlying data.

Depending on your requirements and preferences, it may be sufficient to simply export the underlying OMP data in a format such as Excel spreadsheets for further refinement or calculations. A different approach is to view and manipulate data using "queries". Queries are instruction sets written in the Structured Query Language (SQL) programming language that are executed against the data set. The big advantage of SQL queries is that they represent the native way of working with databases, and as such they are perfectly suited to unlocking the full power of

the relational database data structure. The possibilities are practically endless, but particularly simple yet powerful operations include joining multiple different tables together and grouping or aggregating the data.

There are many different ways to run SQL queries against the OMP data set. One option is to use the Microsoft SQL Server Management Studio (SSMS), which is Microsoft's tool for managing and running queries on SQL Server databases. However, this requires appropriate user rights to be able to install SSMS and to log in and connect to the server and the OMP database. A second option is to set up an ODBC data connection using linked tables in a Microsoft Access file. Compared to the SSMS option, this has the advantage that Access includes quite useful visual query wizards and tools that make it possible to create simple queries without directly learning or writing any SQL code. However, again a suitable login to the SQL Server database is required, and the user must have appropriate permissions within Windows to set up the ODBC connection. In many cases, particularly multi-user scenarios where OMP is running on a central server, individual users will not be granted the necessary IT permissions to be able to run queries in this way.

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To avoid these difficulties, we are planning on including a new "Query Writer" add-in in the next version of OMP. This add-in will give users the chance to use the easy Microsoft Access interface for creating queries, but the queries will be executed using the internal OMP connection and thus will not have extra IT requirements like server logins or ODBC connections. However, if desired it is of course possible to restrict access to the Query Writer tool to individual users with the user access control built into OMP (see the previous edition of this newsletter). With this tool, it will be extremely easy to run customized SQL queries against the OMP data set for any authorized user. We strongly recommend that at least one operator in the plantation invests some time to study SQL query writing, so that he or she can write queries on demand for other users. Of course, the Agrisoft team is also available to provide direct query writing support or additional information such as names of fields and tables. Overall, I'm very hopeful that the new tool will make the power of writing and running customized queries more accessible and easy for OMP users and will help you to get even more out of your OMP data set.

Yours sincerely,

Max Kerstan

Feature

Average bunch weights in OMP-BBC

Short-term crop forecasting based on black bunch counting can be a useful tool for oil palm plantation managers, both for planning labor requirements and other field work and as a monitoring tool to help detect crop losses or crop theft. The general method of the BBC crop forecast was described in more detail in the 34th edition of this newsletter. Roughly speaking, the production forecast is a product of two independent factors: the number of bunches forecasted from the black bunch census and the expected average weight of said bunches.

While the bunch number forecast is conceptually relatively unambiguous, being based on the actual black bunch census and the number of palms in each block, there is no universal consensus on the average bunch weight. Generally, the aim is to estimate the average bunch weight from the historical production data. OMP-BBC allows the user to choose from several options for this calculation, see figure 1.

The option "Historical average ABW by palm age" means that the expected ABW for a given block is simply given by the average ABW of all block records in OMP with the same palm age. This means that the expected ABW will be identical for all blocks of the same age. The other option is based on looking up the latest actual ABW in that same block as a basis for the expected forecast, and then adding on a certain amount based on the time difference between the actual data and the forecast period. This monthly increase can be used to account for the fact that the average bunch weight generally increases over time. It is either possible to use a fixed growth rate in kg/month, or you can let OMP derive the monthly increase from an expected seasonal growth profile and a table of the expected ABW by palm age and land class that can be defined in the OMP picker definitions.

Clearly, the options based on the latest actual ABW in every individual block are potentially more accurate and are suitable in heterogeneous plantations. However, they are very sensitive to errors in the production data recording. For example, crop that is assigned to the wrong block at the weighbridge will lead to distorted ABW values for both blocks that are involved. Therefore, these options should only be used if you are confident that the monthly actual average bunch weights are recorded by block with a reasonably high degree of accuracy. In contrast, using average ABW by palm age "smoothes out" differences

Figure 1: ABW calculation options in OMP-BBC.

Feature

between blocks. If your plantation is not extremely homogeneous, the resulting forecast is less accurate at the individual block level. However, in practice it has proven to provide decent results when looking at the aggregated forecast over many blocks (e.g. at division or estate level). One weakness of this option is that the results can be distorted by old records in the database from many years ago, so it is less suitable for plantations with large OMP data sets spanning many years.

From the discussion above, it is clear that regardless of which calculation option we choose, there are always possible situations where the result might not give an accurate forecast average bunch weight. Even if we assume the historical data to be completely free of errors and outliers, there could be specific reasons such as pest attacks or abnormal weather patterns that will cause the average bunch weight to deviate from the historical expectation in individual blocks. To be able to account for this, OMP 10.3 will introduce the option of entering and editing the fore-

cast average bunch weight for every individual block and month (figure 2).

Of course, the forecast ABW data can also be imported from Excel spreadsheets. However, this does not mean that you are forced to manually calculate and enter the expected average bunch weight for every block yourself. If you want to use the OMP values based on your active calculation setting (figure 1), simply use the button "Load calculated ABWs". This will open the form shown in figure 3. The form shows the OMP calculated ABW on the left side and your currently entered forecast ABW on the right. You can select which records should be updated. If you have only manually edited the values of selected blocks and you wish to recalculate and update the ABWs for all other records based on the historical data, simply select all records and ensure that "Manually edited records will be kept" is selected in the option at the top of the form.

We are confident that this new option of entering and editing individual blocks' ABWs will greatly

Division	Field	Block	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Center D01	MT06	301A	27.7	27.8	27.9	28.0								
Center D01	MT08	301B	25.8	25.9	26.0	26.1								
Center D01	MT07	301C									29.7	28.6	27.9	28.5
Center D01	MT09	301D	26.2	26.6	25.2	25.9	27.2	25.1	25.9	26.0	26.1	25.5	26.6	25.8
Center D01	MT05	301F	26.2	26.3	26.4	26.5								
Center D01	MT07	302A	28.2	28.3	28.4	28.5					29.0	27.5	28.1	28.6
Center D01	MT06	302B												
Center D01	MT08	302C	29.0	29.1	29.2	29.3								
Center D01	MT09	302D	29.0	30.3	28.7	29.3	28.4	29.7	29.0	29.1	28.3	28.6	29.4	28.2

Data entry forecast ABW — Year: 2017 — Load calculated ABWs — Forecast ABW [kg]

Figure 2: Forecast ABW data entry form.

Feature

Figure 3: Form to load calculated ABWs.

enhance the flexibility of the forecasts and will allow operators to eliminate outliers in individual blocks. The fact that the ABWs can be filled with values based on the historical calculations at the click of a button means that this is achieved without adding significantly to the work load for the data entry operator. If you wish to continue using only the historical calculated values without edits (i.e., the same results that you would have got with previous versions of OMP), you will need just one additional button click per survey month. On the other hand, if you prefer to use your own algorithm for estimating the average bunch weights that is not covered by the options in figure 1, you are free to import your forecast ABWs completely and can skip the historical OMP calculations completely.

The fact that from OMP 10.3 the forecast ABWs will be stored in their own table rather than being calculated "on the fly" every time they are needed as in previous versions of OMP has a number of secondary advantages. For one, values that were entered once will only change when you explicitly edit something, either by editing or importing data or by using the button to load new calculated ABWs. In previous versions of OMP, the forecast would change "after the fact" as the underlying historical data in OMP changes when new production data rolls in (in particular the calculation mode "average ABW by palm age" is sensitive to changes in the production data), which could cause confusion among users who see forecast data for past months suddenly change on their reports compared to the last time they opened OMP. A second advantage is that the speed of data entry forms, reports and charts is improved as they no longer need to do the complicated historical ABW calculation every time. Lastly, the fact that the forecast ABWs are now in a table in the database means that they will be available to work with for users who wish to directly access the OMP database using custom queries or linked tables.

From the developers desk

A selection of the on-going developments and plans which are part of our constant efforts to continue to improve Agrisoft products.

OMP-BBC

- Option of entering / editing predicted average bunch weight (ABW) values
- Finer control on when forecast average bunch weights are recalculated
- Modernized importing from Excel, streamlined data entry form
- Report for 4-month bunches/palm vs actual at division and field level
- On report for 4-month bunches/palm vs actual, show only "complete" months
- Additional options for forecast vs actual and variance reports
- Forecast vs actual comparison for bunches/palm by harvest month
- Rule-based assignment of monthly distribution

Pesticides in OMP-DBMS

- Pesticide data to be migrated from OMP-PM add-in into OMP-DBMS
- Modernized importing from Excel for pesticide data
- Integration into OMP-DBMS picker definitions
- Redesigned and recoded data analysis forms and reports
- Improved speed for reports and chart forms
- Preparation for integration with upcoming field work / resource use module
- Split analysis for regular pesticide application vs pest & disease control

OMP-GIS

- Mapping for block-level aggregated OMP-FS results
- Mapping of block-level OMP-FS expression results
- Improved display of block labels at higher zooms
- Support for overlapping block labels
- Unused categories no longer shown in legend
- Setting to choose status day for map "days since last harvest"