Message from the Management

A look back at 2017 and outlook for the coming year

Dear Customers and Friends,

The Agrisoft Systems team wishes you all the best for a successful year 2018! The last year was a year of big changes and new developments in OMP, with the release of our first mobile smartphone application in OMP Field Survey as well as the major redesign of the OMP frontend and menu in OMP version 9.0. In this newsletter, we review the most important developments of the past year and discuss the projects we are planning and/or already working on for 2018. The newsletter also contains a dedicated article which takes a closer look at the new OMP Field Survey add-in and data collection app.

In the first half of the year, we were kept busy with the work on the OMP 9.0 release. The increase in the main version number may have come as a surprise to experienced OMP users, because prior to this release, we had used the main version number OMP 8 for more than 15 years! While of course OMP 8 evolved massively over this time with many sub-releases, the big difference in OMP 9 compared to previous releases is that for the first time we reorganized the entire program flow, redesigned the main menu and unified the user interface of the main OMP application. We are confident that the new thematic menu in particular is far more intuitive and greatly improves the usability of the program, while also providing flexibility to be extended in the future when new modules are added to OMP.

Of course, the changes in OMP 9 were not purely cosmetic, and the release includes many other improvements throughout the program. For ex-

ample, the entire system settings and pick-up list area was redesigned for greater consistency and ease of use. The module for importing data from Excel was recoded from scratch, with built-in data verification and detailed messages which help the user to easily find and eliminate mistakes in the import spreadsheets. OMP 9 also includes a significant number of new fields to record even more data about your plantation. The new fields include additional field upkeep parameters like e.g. circle and path weeding, visual deficiency scores for LCP and soil nutrient deficiencies as well as climate data such as photosynthetically active radiation and tensiometer readings. One of the most frequently used reports in OMP, the block history report, was extended and redesigned to include even more information. Further additions include a new site and soil characteristics overview report and new vegetative growth histogram charts. Finally, OMP 9 also includes major improvements to the OMP-GIS module, with a redesigned mapping menu and the option to customize and save definitions for thematic mapping ranges and colors directly in the OMP settings area.

In addition to the more visible changes described above, a lot of the work was put in "under the bonnet" to streamline and modernize the underlying OMP code base and data structure. This step is crucial to pave the way for our further development plans, for example the redesigned data structure of the OMP pick-up list tables was

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essential to the development of OMP Field Survey (OMP-FS). The new OMP Field Survey module for flexible field data collection was the second major development project of 2017. OMP-FS is an integrated solution comprising an Access desktop application similar to the other OMP add-ins, plus an Android app for smartphone- or tablet-based data collection in the field. The desktop program provides huge flexibility in defining questions and survey types to match exactly the type of data you want to collect in the field. In particular, you can choose from a large selection of "OMP questions" which are defined to precisely match entry fields in OMP. However, it is also possible to define completely flexible "user-defined questions". The relevant definitions are then transferred to the Android application, which greatly helps with collecting accurate data by providing an easy-to-use data entry interface and eliminating the potential for mistakes when manually transcribing data into the main OMP database. When the survey results are transferred back from the app to the desktop database program, the data is automatically aggregated up to block, field, division

and estate level. This data can then be either transferred into the main OMP block data set, or it can be analyzed directly within the OMP-FS application. User-defined expressions provide a powerful mechanism to calculate summary scores and more advanced data analysis quantities from the raw survey data. I encourage you to take a look at the dedicated article within this newsletter for more details on the OMP Field Survey module.

Our main focus for the development in the new year is to continue with the transition to an SQL Server back-end database, and to work towards adding a web-based reporting interface to complement the in-depth analysis features of the OMP desktop program. One of the defining features of OMP over the years has been it's light-weight design, making it relatively easy to share data files even in locations with limited internet connectivity and allowing anybody to easily run a copy of OMP on their own laptop. With the SQL Server migration, we aim to provide better support for server- or cloud-based installations to
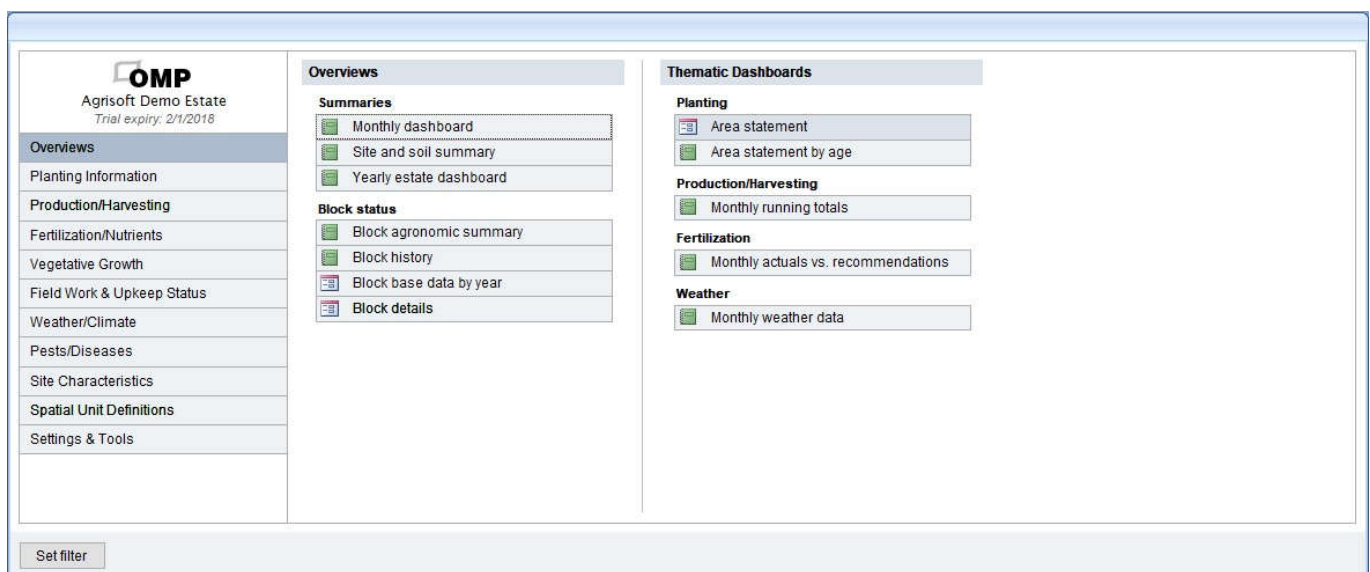

Figure 1: Main menu of OMP 9

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take advantage of the ever-improving network and internet connections at many plantations. However, we will work hard to make sure that it remains easy to run OMP in a standalone offline mode as you have been used to in the past.

While the SQL Server migration obviously involves a lot of "behind the scenes" work which may not directly affect how OMP looks from a user perspective, we are of course also working on various other features which will provide immediate improvements. One of the main features we have been working on is multi-language support for OMP in Spanish and in Bahasa Indonesia. Furthermore, we have been streamlining and improving some of the features related to daily production reporting, including a new daily production dashboard in OMP-HRR. The upcoming version of the OMP Fertilizer Planner will also contain various additions, the most important of which is the option of defining doses using formulae rather than fixed amounts. This signifi-

cantly increases the flexibility of the application, as you can define scenarios with constant doses as well as formula-based variable doses in any combination. Other improvements include the option of importing organic fertilizer recommendations from Excel and improved totals lines on data analysis forms.

2017 was a successful year for Agrisoft not only in terms of software development, with new installations in Latin America, Indonesia and Papua New Guinea contributing to an increase of the overall OMP licensed area of over 100,000 ha. I would like to take this opportunity to thank all our customers for their continued trust in OMP and all the positive feedback we have received; we look forward to making OMP even better for you in 2018!

Yours sincerely,

Max Kerstan

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OMP Field Survey and Survey App

This article first appeared on www.agrisoft-systems.com.

Any agronomic analysis tool such as OMP relies fundamentally on the quality and trustworthiness of the basic data that is input into the database. In an oil palm plantation, some kinds of data can be collected relatively reliably and easily using various kinds of automated or semi-automated measurements. Typical examples would include weighbridges with automatic digitalization of production data, automatic weather stations, or more recently automated palm counts using LIDAR, drone or satellite imagery. However, many crucial kinds of field data, in par-

ticular relating to field upkeep standards, harvesting performance, nutrient deficiency scoring or pest and disease monitoring still require manual evaluation and scoring by trained survey personnel in the field.

The large scale of a typical oil palm plantation offer up a number of specific challenges in this regard. As there may be multiple surveying teams within a plantation (and even more within a larger company or group with multiple plantations), one main issue is to ensure that questions, criteria and measurement techniques are standardized and clearly communicated to all surveyors. This is critical in order to reduce the

Figure 1: Details of a question linked to an OMP field.

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subjective nature of the collected scores as much as possible. A second problem is to ensure that data is being collected at the correct locations within each block, e.g. some surveys should be carried out at designated LSU palm locations, others maybe at fruit collection points or along harvesting paths and so on. Closely related to this, in some cases it is necessary for management to be able to check that surveyors have really visited the prescribed locations and did not simply hand in surveys with fictional data, particularly for locations that are hard to reach. A third major issue is how to process and aggregate the raw data collected at many individual points within each block into meaningful data at block level. Many surveys are still carried out in paper form today, in which case the process of simply digitizing the results can be a significant amount

of work, in addition to being prone to transcribing errors.

The new OMP Field Survey add-in (OMP-FS) and associated survey app for Android tablets or smartphones is a powerful tool to help tackle the issues outlined above. As data can be recorded in electronic form directly in the field, the need for any transcribing of paper survey forms is eliminated. Standardization is enhanced because all survey parameters are defined in a unified manner in the OMP-FS add-in. A key aspect in our program design has been a focus on flexibility, as field conditions and thus surveying requirements may vary widely for different plantations. The fundamental object in OMP-FS is an individual survey question. A question definition includes specification of the parameter to be surveyed,

Figure 2: Details of a user-defined question.

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the type of entry control used to enter the data in the survey app, data types, bounds or allowed responses as well as information on how the results are to be aggregated up to block and higher spatial levels. When defining a question, it can be either based on an OMP field (see figure 1) or completely user-defined (figure 2). For OMP questions, all definitions, including any pick-up list values, are automatically taken from your main OMP data set. This guarantees that the resulting data will have the correct shape to be able to easily write the results into your main OMP block data set, which is the main advantage of an OMP question. User-defined questions on the other hand allow full flexibility in the definitions; however, the resulting data will not necessarily be directly importable into the main OMP block data. Of course, even if there is no matching OMP field you can still aggregate and analyse the results within OMP-FS.

Once questions are defined, OMP-FS allows you to combine multiple questions into a so-called „Survey type", which defines which questions are to be surveyed together during a single field visit. It is also possible to mark certain questions as „required" within a survey type, in which case the surveyors will not be able to save a result with the OMP Survey App for this survey type unless all required questions have been answered. Surveyors may be grouped into surveyor groups, and it is possible to limit a list of surveyor groups that are assigned to any given survey type, to avoid that certain types of surveys are carried out by unqualified or unsuited personnel.

All definitions are transferred between the OMP-FS add-in and the Survey App via encoded text files which can simply be sent via email. The same technique is applied in reverse to send survey results from the app back to the OMP-FS add

-in. Once definitions have been imported into the app, surveyors can log in, choose a survey type and start surveying with just a few taps (see figure 3). The survey entry screen displays a list of all questions for the selected survey type (figure 4), with data validation built in and the entry control matching the question definition made in OMP-FS. Figure 4 shows only two options for question entry types („slider" and „picker"), various other options are available in-
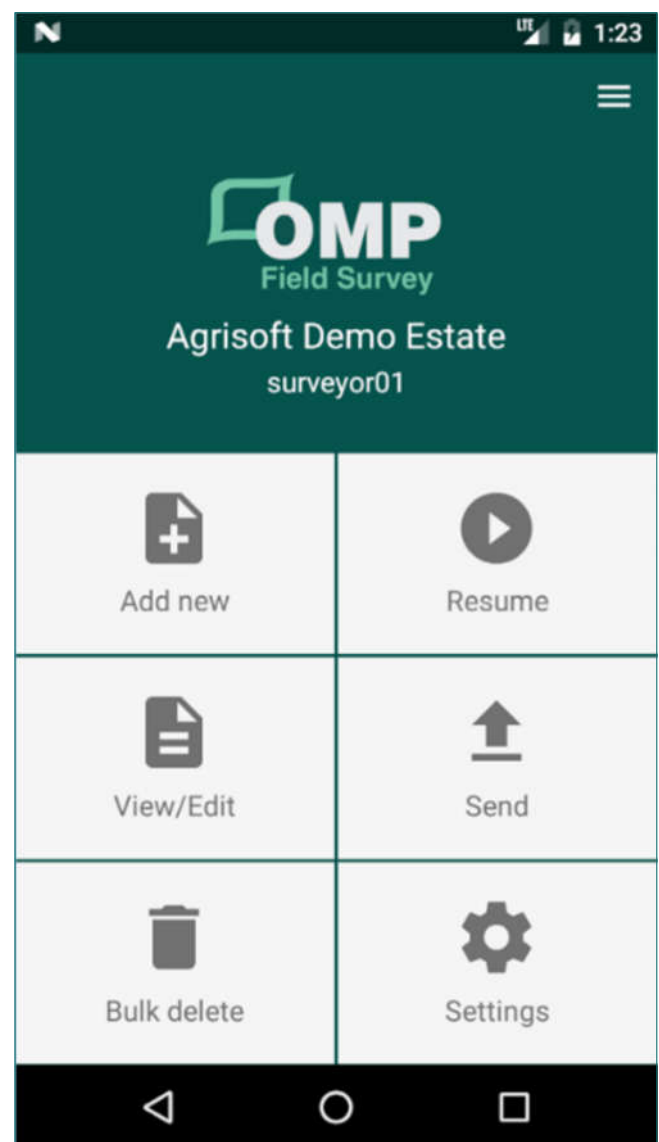

Figure 3: OMP Survey App main menu

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cluding free entry textboxes, „steppers" for counting things or simple buttons for yes/no questions.

For questions of type „picker", responses are chosen from the list defined in OMP. All question details can be viewed using the details button, including detailed descriptions of bounds or the criteria that correspond to each possible allowed response value.

Figure 4: OMP Survey App questions form.

Apart from helping to standardize questions and responses and eliminating the need for transcribing paper results into electronic form, the OMP Survey App can also help with the other problem mentioned above, namely ensuring that surveys are carried out at the correct position and locations are recorded correctly. For cases where results are to be taken at certain predefined points within a block, OMP-FS allows you to predefine lists of such points for each block. There are four different categories of predefined points: palm points, fruit collection points, harvest paths and other special points (to be used for special points that do not fall into the previous categories like e.g. bridges, culverts etc.). Palm points can be further subcategorized into user-defined groups such as LSU palms, BBC palms and so on. All predefined points can be georeferenced and, depending on the point type, may have some additional information such as a palm row and number. The definitions file sent to the app includes the list of blocks and all predefined points.

When entering a new survey results at a predefined point, users can choose the division, field, block and point ID from the relevant lists, reducing errors of mistyping (see figure 5). This can be even further simplified if you label special palms with cards showing a QR code with the relevant location information (see figure 6) for a sample code. The OMP Survey App can then simply scan this QR code and fill in the information automatically. Because OMP-FS allows you to see whether a point was scanned or entered manually, a system using such QR cards has the additional advantage that surveyors are really forced to go to the palm location to scan the code, i.e. there is no possibility of entering results without actually visiting the palm.

Of course, for some types of surveys it is also

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Figure 5: Survey point location for a predefined palm point.

possible that the survey points are not known in advance (e.g. surveys looking for palms affected by a certain disease). In this case you can switch to „free entry" point mode, in which case the point can be identified by a freely typed palm row and number or by a unique name, as required. Finally, OMP-FS also supports a point mode „block" which may be used whenever you

want to take a single result valid for the block as a whole and does not belong to any particular point within the block (e.g. an overall count of diseased palms in the block).

If your survey device supports GPS, it is straightforward to also record the GPS position at which the survey result was taken using the „Set" button visible in figure 5. If you want, a reminder can be activated that warns users if they are trying to save the survey result without having taken the GPS position. Note that this GPS information is supplemental and independent of any geocoordinates which may have been entered as part of the definition of a predefined point. This means they provide an independent check that the survey results were taken at the correct locations. If desired, survey point geolocation data can be easily exported from OMP-FS in Excel format for mapping with any type of GIS software.

Figure 6: QR code for encoded text: Center D01#MT04#302E#LSU0201.

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Figure 7: Sample expression for an effective severity.

No matter what type of points the survey data is collected at, having multiple data points per block raises the question of what value for a given parameter should be assigned to the block as a whole. This is particularly important as most field management as well as almost all analysis within OMP works with block-level values. One of the most important functionalities of OMP-FS is that all survey data is automatically aggregated up to block, field, division and estate level according to the aggregation modes defined for each question. Points are grouped for aggregation either by explicitly assigning them to named „scheduled surveys" or simply based on the survey date spread in the case of unscheduled surveys. This automatic aggregation is one of the core features which sets OMP-FS apart from other survey apps which are not custom built for the purpose of field surveying in oil palm plantations.

While this aggregation is already a very powerful feature for data analysis, it can also be useful to

go one step further and consider calculated data which is not surveyed explicitly but which instead is calculated from the aggregated results at each spatial level. OMP-FS allows the user to specify completely general expressions or calculation formulae that are used in this manner to compute derived values from the aggregated data. One main use case for expressions is to calculate summary scores from multiple questions, such as for example an overall harvesting score for the block which is calculated from three individually surveyed questions on loose fruit collection, bunch harvesting and bunch collection. Another use case is to convert raw survey data into a form suitable for import into OMP. An example of this type of expression is shown in figure , where the raw survey data is a count of the number of palms affected by a certain pest or disease outbreak, and the expression converts this into a severity score of 0, 1, 2 or 3 depending on which percentage of palms in the block is affected.

Overall, OMP-FS and the Survey App offer a flexible integrated solution to the problem of collecting field data in oil palm plantations. With built-in aggregation and expressions, it even goes one step further to help you transform raw survey results into meaningful information that can be translated into explicit management actions for yield improvement.

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 Plantation

- Multi-language support for Spanish and Bahasa Indonesia
- New layout for print reports
- Consistent handling for form print out reports, including right-click filter from the form
- Active implementation of global filter to refresh forms only when needed
- OMP-GIS for 64 bit MapInfo
- Migration of back-end database to SQL Server
- Tools to export/import data from SQL Server into a compact format for easy file-sharing
- Integration of daily production recording (OMP-HRR add-in) and crop budgeting into main OMP application
- Integration of new field work module as developed in BMP

OMP Field Survey medium term plans

- Multi-language support for Spanish and Bahasa Indonesia
- Support for scanning NFC chips
- Option of using web-servers instead of email for data transfer
- iOS support
- Print reports for raw and aggregated results
- Survey status overview data analysis form
- Data analysis form for development of surveyed parameters over time
- Additional features for pest and disease surveys

OMP Fertilizer Planner

- Option of entering formulae rather than fixed amounts for nutrient doses
- Import from Excel for organic fertilizer recommendations
- Improved handling for totals lines on DA forms
- Yearly subtotals for immature fertilizer programmes on scenario settings report
- Data analysis form for details of immature programmes