Agrisoft Systems
NEWSLETTER
Thirty-third edition, Apr.— Jun. 2020

Message from the Management

New OMP version for SQL Server

Dear Customers and Friends,

In the past three months, we have completed the development of the new version OMP Plantation 10.0. As we have already mentioned in previous editions of the newsletter, this update with the move to a completely different database engine for the back-end data storage marks one of the biggest steps in the entire development history of OMP. This switch required a large number of technical changes in the code base underlying OMP in order to adapt the data linking functions to the new back-end and to keep all forms and reports running smoothly. Of course, besides the technical compatibility with SQL Server we also added many new features and reports to the OMP program itself. Consequently, the development time for this upgrade was a bit longer than our normal version iteration time frame. However, the move to SQL Server had become unavoidable due to ever increasing amounts of data being recorded with OMP, including daily palm-based survey data with the OMP Field Survey app. This meant that many of our customers were close to reaching the maximum storage capacity possible with Access database files. SQL Server as Microsoft's flagship database engine provides far more storage capacity as well as better general performance and many other new options. The main focus of this newsletter is a closer look at what is new in OMP Plantation 10.0 in the following feature article.

Of course, the last three months for Agrisoft have still been heavily influenced by the Coronavirus. Unfortunately, cases in Indonesia are still rising and we are continuing our policy of working from home for the foreseeable future. While as an IT company this is not a big problem for us from a work perspective, it would of course be nice for our team to be able to return to a more normal working environment and to see each other more regularly. We are now in the process of slowly rolling out the OMP 10.0 update to all our customers, like previous updates this is a process that can happen entirely remotely as all required files and documents are provided for download and we can provide support where required using remote desktop, Skype or Zoom. The data preparation process for new OMP installation in Honduras and Mexico has also been going on completely remotely. Just like in previous installations that we have carried out completely remotely, this is working very well and I'm sure that the same will apply to the remote training and installation.

With the major release that has dominated our development work for the past year and a half out of the way, we are now of course working on new projects. The main additions we have planned are a new standalone mapping application and a field work module that can capture usage of materials, equipment, labor and fuel for any field upkeep task. As usual, the last section of this newsletter contains a more detailed description of the things that we are working on.

With best regards,

Max Kerstan

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What's new in OMP Plantation 10.0

The OMP 10.0 release includes probably the single biggest version-on-version change in the history of OMP with the migration to an SQL Server back-end database. This migration to a more powerful database engine had become unavoidable with the ever-increasing size of the OMP data set, in particular with daily survey data recorded using the OMP Field Survey add-in. To adapt OMP to a new back-end database engine required us to make many technical changes to the queries and OMP code, but we have also included a large number of usability improvements and feature additions. This article provides an overview, for a more complete list of changes please refer to the dedicated "What's new" document that we send as part of the upgrade instructions.

The new SQL Server back-end database has a number of advantages compared to the Microsoft Access database used in previous versions OMP:

- SQL Server databases can store much higher amounts of data compared to Microsoft Access files.
- The new back-end allows us to move more calculations onto the back-end rather than doing all calculations in the client-side/frontend. This is an advantage in network-based installations as it reduces the amount of data that needs to be transmitted through the network.
- All OMP Plantation data is now stored in a single SQL Server database, whereas previous versions of OMP had individual data files for each add-in. This simplifies relinking, maintaining backups and also provides more options in the OMP data analysis as data from all add-ins is available to be displayed on forms and reports.
- SQL Server provides higher data security, in particular nobody will be able to link to and edit your OMP data tables unless you have explicitly given them access to OMP or an SQL Server login with the appropriate permissions.

Compared to previous versions of OMP, the new back-end database greatly simplifies the process of updating OMP to a new version or patch in the future. In previous versions, a change in the back-end table structure meant that the OMP setup would simply replace your back-end database files with a fresh set of empty OMP data files. This meant that after every update you would have to manually open the back-end of every OMP add-in and import the data from the previous version. With the new SQL Server back-end this will not be necessary in the future, as all structure changes will be applied using change scripts directly to your existing database. Furthermore, in the future it will no longer be necessary to manually re-link the OMP application to your data files after installing a new version, as was previously required if you had installed OMP outside your default path.

We have completely recoded and modernized the actual installation / setup wizard for OMP 10.0 to comply with the standards used in Windows 10. In particular, OMP can now be uninstalled via the standard Windows add/remove programs interface. On a technical level our setup file is now estate-independent, whereas in the past we had to create an individual setup file for each customer estate.

In contrast with Microsoft Access databases, SQL Server database files are locked and cannot be simply copy-pasted onto a different computer or server unless the databases are explicitly detached and re-attached using the SQL Server Management Studio. In order to allow users working on different computers or servers to send OMP data to each other, OMP 10.0 includes a new custom-built module to export or import batches of data in the format of SQL Server back-up file (.bak files).

The new system provides significantly more flexibility and power than simply copying entire OMP Access data files as in previous versions of OMP. In particu-

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lar, it is now possible to export and import partial data sets, where you can choose sets of related data tables and even specify restrictions to particular years or divisions.

All continuous data analysis forms in OMP-DBMS now support direct exporting of form data to Excel. Two new fields have been added to the global filter feature. It is now possible to apply a global filter for land

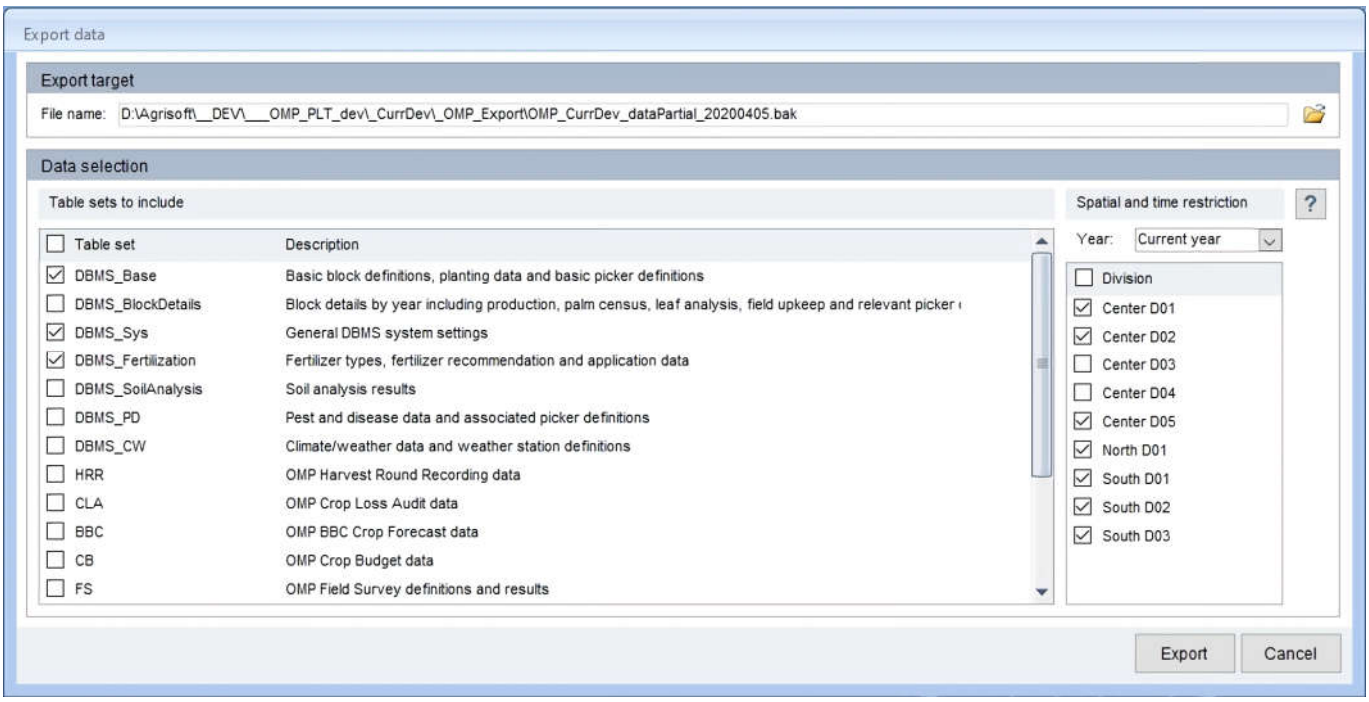

Figure 1: Settings for partial .bak data export.

The option of restricting data to only certain divisions or certain subsets of tables is particularly useful in situations where multiple different users on different computers are responsible for entering data. A typical example is a plantation with multiple divisions where different data entry clerks are responsible for entering and editing data for the different divisions. More details about data sharing with .bak files can be found here.

The user access control (UAC) settings in OMP 10.0 have been expanded compared to previous versions for additional flexibility. In particular, it is now possible to assign permissions to users in a more finely grained manner. For example, permissions to edit key data including OMP Fertilizer Planner recommendations, crop budgets or OMP FS survey definitions can now be separately controlled.

class or weather station ID in addition to the various parameters that were already available in OMP 9.3. Besides this, we have completely changed the logic controlling when data is reloaded on data analysis forms. In previous versions of OMP, data analysis forms would refresh their data every time the form was activated. This could become very slow and annoying when switching back and forth between different data analysis forms, because the program would reload the data every time we moved to the different form. To avoid this problem, data analysis forms in OMP will now load their data only when they are opened the first time, when new settings or restrictor values are applied on the form or when global filter settings have been changed. In this way, time spent waiting for data to refresh unnecessarily has been greatly reduced when doing normal OMP data analysis work.

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OMP 10.0 includes a completely new data analysis form and associated print report focused on monthly production and harvesting parameters. The form can be opened via the menu point “Monthly/YTD production” under the section “Production & Harvesting” in OMP-DBMS.

When designing the new form and report, we put particular emphasis on maximum flexibility, allowing the user to choose from a number of grouping and display options. The form and report display three parameters for every month of the year as well as the yearly total. Each display parameter can be chosen independently from a list of 28 options while there are 13 grouping options, which means that there are over 250,000 possible combinations (see figures 2 and 3)!

Figure 4 shows a sample screenshot of the form print out report. In this example the data is grouped by planting material while the chosen display parameters are the actual yield in t/ha, the actual yield as a percentage of the budget yield, and the average bunch weight in kg. In combination with global and local filters, the new form and report are ideally suited for analysing the monthly distribution of production parameters. This is particularly important for planning, budgeting and crop forecasting purposes.

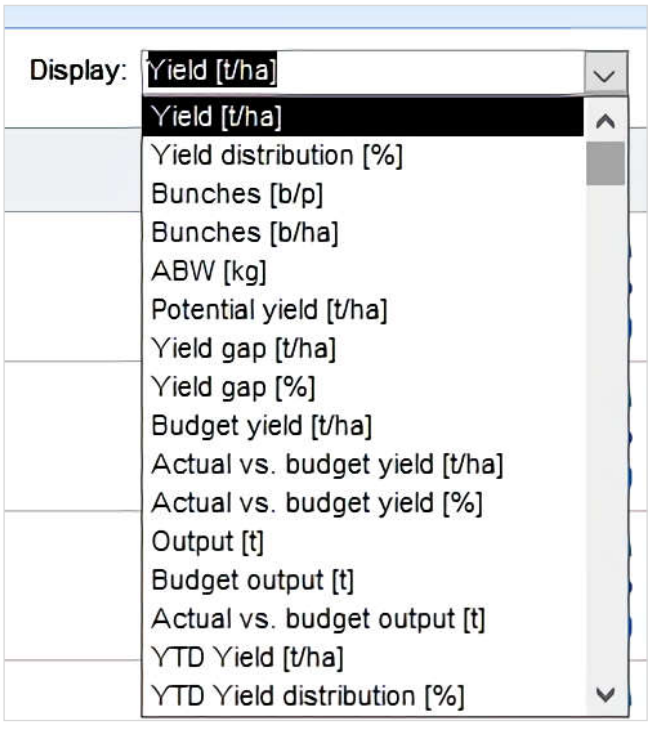

Figure 2: Display options for "Monthly/YTD production"

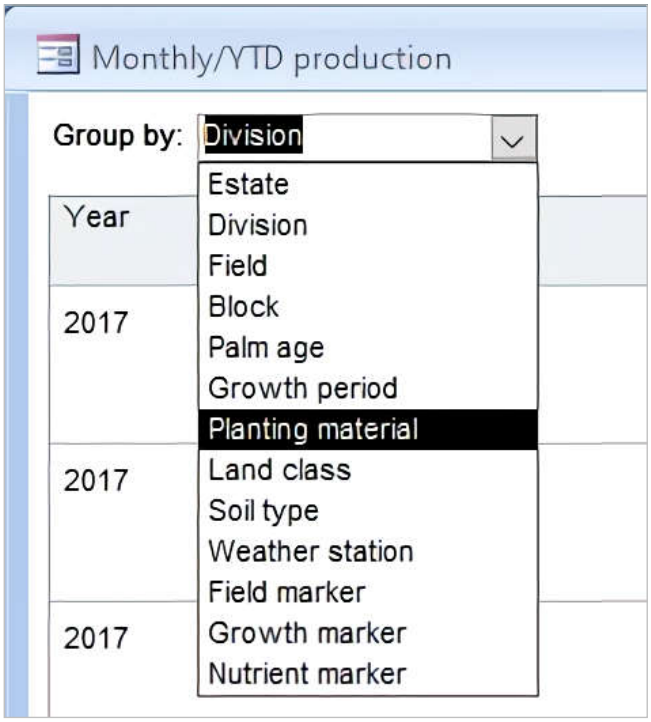

Figure 3: Grouping options “Monthly/YTD production”

Based on requests from some of our customers, we have extended the list of nutrients covered in the OMP 10.0 fertilization modules to include Chlorine, Silicon, Iron and Zinc (Cl, Si, Fe and Zn).

For all the new nutrients, it is possible to define the contents in fertilizer definitions and also to record leaf analysis results. Furthermore, all nutrients are fully supported in the OMP Fertilizer Planner. We have also introduced a “relative agronomic efficiency” (RAE) parameter for Nitrogen. This parameter works exactly the same as the existing RAE parameters for P and Mg.

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OMP Data Print Out – Monthly/YTD production: Planting material

Display: Yield [t/ha], Actual vs. budget yield [%], ABW [kg]
No filter active.

Year	Planting material			Jan	Feb	Mar	Apr	May	Jun
2017	ASD	Act. yield	t/ha	1.2	1.1	1.3	1.2	1.2	1.1
		Act. - Bud.	%	69.3	50.0	68.3	32.1	30.8	15.8
		ABW	kg	21.0	19.9	20.0	19.0	18.2	16.5
2017	Marihat	Act. yield	t/ha	1.9	1.9	2.1	1.9	1.9	1.8
		Act. - Bud.	%	52.2	42.7	45.3	20.6	15.1	-0.3
		ABW	kg	20.9	20.9	20.8	20.4	20.4	19.9
2017	Mixed	Act. yield	t/ha	1.2	1.1	1.2	1.2	1.3	1.3
		Act. - Bud.	%	71.7	57.5	60.4	40.9	48.2	30.9
		ABW	kg	8.9	8.7	8.8	9.1	9.3	9.2

Figure 4: Partial screenshot of "Monthly/YTD production" report.

Wherever possible, we have tried to extend reports and data analysis forms related to fertilizers or nutrients to show all nutrients. However, space constraints mean that in some places only a limited number of nutrients can be included. To handle this we have introduced a “display order” setting as shown in figure 5. This setting determines which nutrients will be shown first in those places where space is insufficient to show all. This system makes it possible for users to pick those nutrients which are particularly important in their location, while trace elements that are less important in their specific estate can be pushed down the order. The most important elements (N, P, K, Mg and B) are always shown

In OMP 10.0 we have also greatly increased the flexibility of the way critical levels can be handled for leaf and rachis nutrients. In previous versions of OMP, it was only possible to define critical leaf levels for the 4 most important nutrients for three hard-coded age bands (0 to 8 years, 9 to 14 years and > 14 years). In the new system, users can define as many age bands as required. Furthermore, critical levels can be entered for all leaf analysis parameters, including trace elements, rachis nutrients and total leaf cations. We have implemented conditional formatting on many of the data analysis forms and reports in OMP-DBMS that show leaf analysis results, so that values below the relevant critical level are highlighted in red.

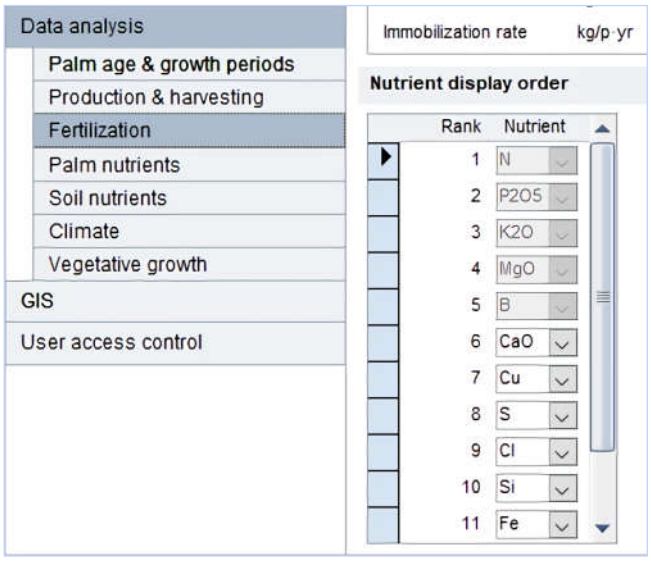

Figure 5: System settings for nutrient display order.

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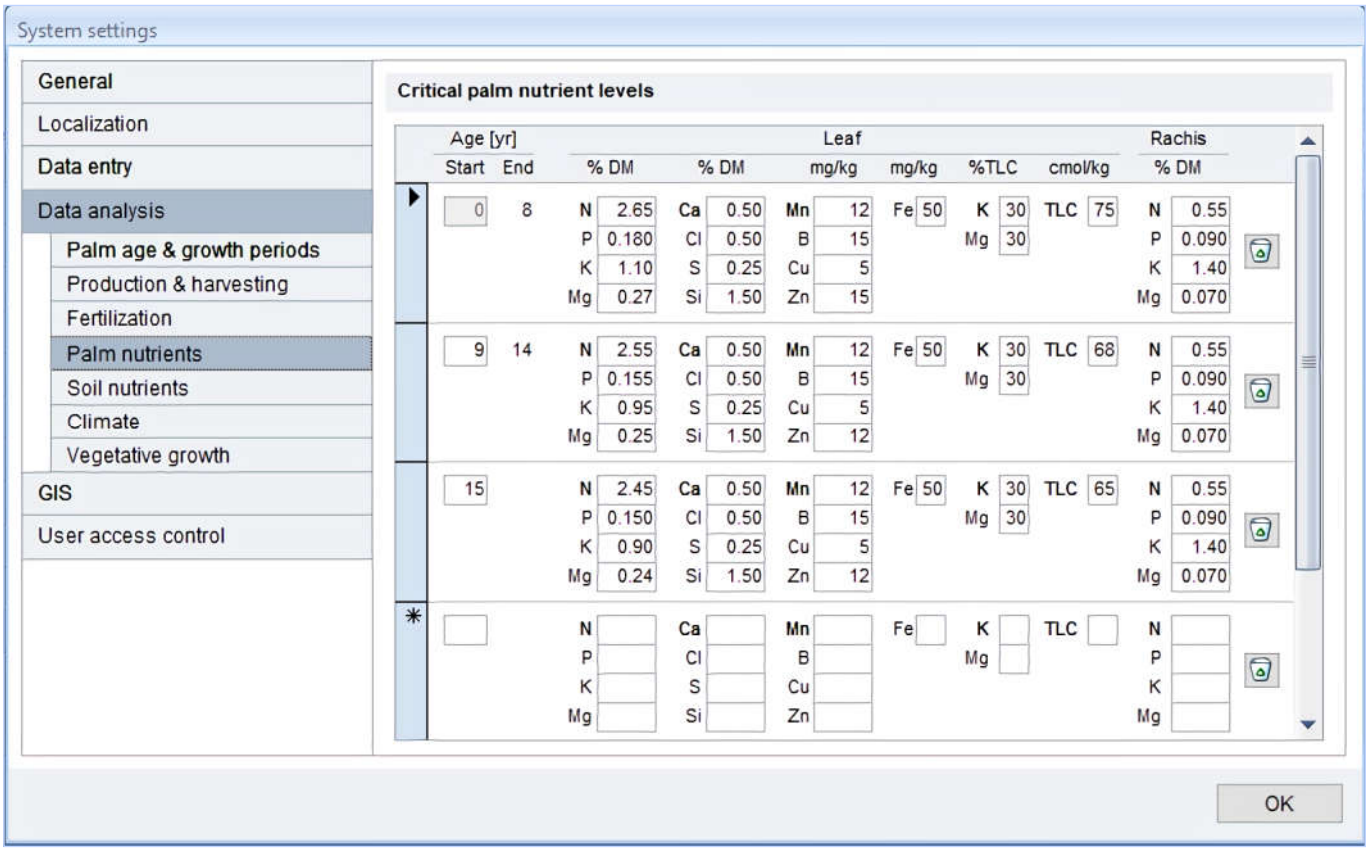

Figure 6: Definitions area for critical leaf analysis values.

In the OMP palm census recording, we have added an additional category “vacant”. This makes it possible to correctly identify vacant points where palms could potentially planted (in contrast with the existing category “unplantable”). Note that it can also be advantageous to correctly differentiate between “dead” palms that have died but where the palms have not yet been removed from true vacant spots, because dead palms can be a potential breeding hotspot for various pests.

In OMP 10.0 we have also changed the way that thinning data is recorded. In previous versions, each yearly OMP block record contained an independent field for a thinning date and a number of palms thinned. In the new version, we have moved to a date-based system where thinning data is recorded independently of the block record year. In this way, the entire thinning history is always visible on the block data screen regardless of which data year we are viewing, and inconsistencies are avoided. The data analysis form, report and chart comparing thinning and production data have also been completely redesigned and recoded in OMP 10.0. As shown in figure 7, the forms now show the development of most important production parameters yield, ABW and bunches per ha in the 4 years before to the 4 years after thinning.

Thematic mapping ranges for OMP-GIS mapping can now be defined for all maps which graph numeric data. This includes maps for fertilizer and pesticide application, where range definitions were not possible in previous versions of OMP. The problem for these maps is that different types of fertilizer or pesticide may require very different ranges. For example, typical application amounts for Borate fertilizer are

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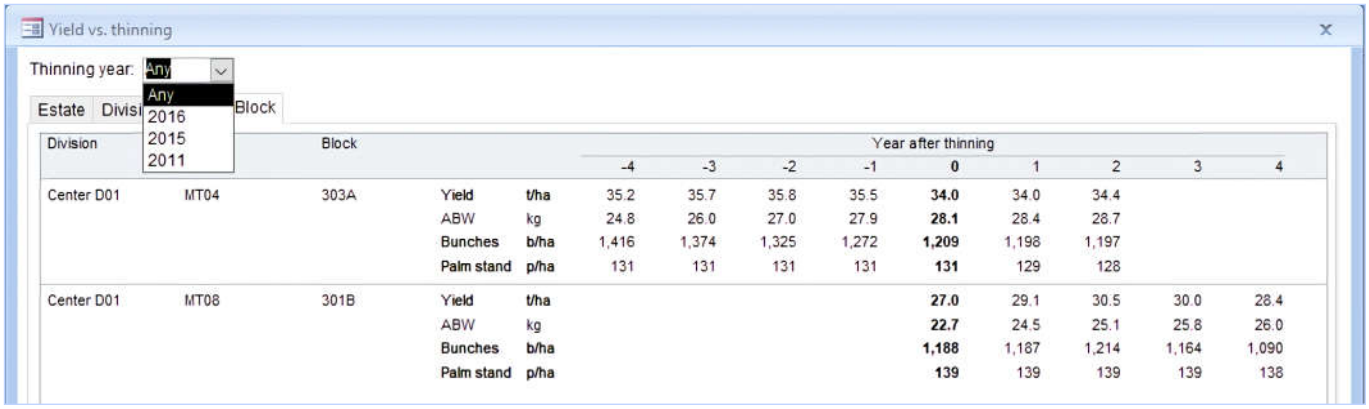

Figure 7: Data analysis form "Yield vs. thinning".

much lower than those of, say, Urea. Therefore, in most cases it is impossible to display a meaningful map for both Urea and Borate application using the same range definition. On the other hand, maintaining completely independent range definitions for every single type of fertilizer or pesticide that you may use would be impractical. To solve this, OMP 10.0 allows you to define four different range definitions for these types of maps. Each fertilizer or pesticide in OMP can then be assigned to one of these four ranges. Any fertilizers newly added to OMP will be assigned to range 1 by default.

The OMP Black Bunch Count Crop Forecast model is based on two fundamental components, the estimated number of bunches that will be harvested and the expected bunch weight. In OMP 9.3, most functionality in the OMP Crop Forecast add-in was focused on the first factor, predicting the number of bunches. On the other hand, the average bunch weight used to predict upcoming production was fixed to always use the historical average bunch weight per palm age. In OMP 10.0 we have fundamentally re-coded the crop forecast calculation and added a number of settings to give you more control, including the possibility of choosing an alternative method for the ABW calculation. A screenshot of the updated settings form is given in figure 8.

If we carry out the black bunch count in month x, this determines the crop forecast for months x+1 to x+4. The number of bunches that we expect to harvest in each block is calculated based on the following factors:

- black bunches per palm counted during the census in a set of survey blocks
- for “child” blocks where no black bunch count was carried out, the black bunches per palm value from the assigned survey block is used
- the latest palm stand in each block
- the monthly distribution we have defined for which fraction of the bunches we expect to become ripe in each of the following four months
- the expected bunch loss rate

The expected bunch loss rate is a new setting we added in OMP 10.0. This setting can be used to account for the fact that some plantations record the actual production in OMP using the number of bunches that actually arrive at the mill, instead of the number harvested in the field. These two numbers can be different due to losses during transportation, rotting of bunches left for too long at the side of the road etc. The number of bunches directly derived from the black bunch count is clearly an estimate of the number of bunches that will actually be available to be harvested in the field. If you have significant bunch losses, and you want to forecast your production for the number of bunches that really reach the mill, you can use the new bunch loss rate setting to reduce the number of bunches accordingly. As the loss rates

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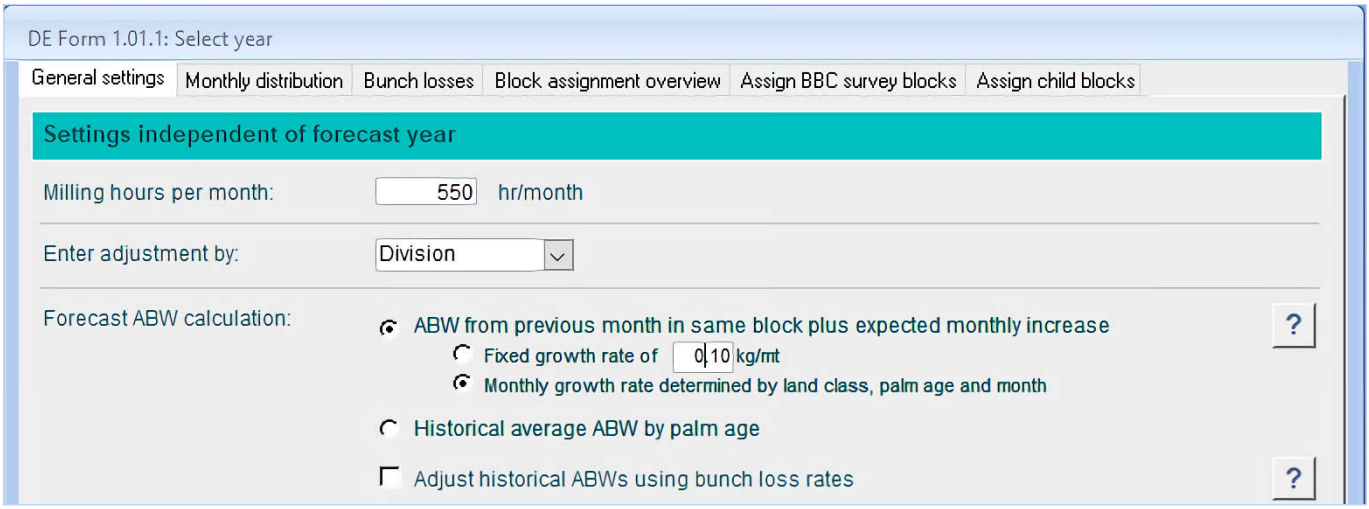

Figure 8: Crop forecast settings in OMP 10.0.

might be different in different parts of your plantation and may change over time, OMP 10.0 allows you to enter different bunch loss rates by division and year.

Once we have forecasted the number of bunches for months x+1 to x+4, the next step is to multiply this with an estimated average bunch weight for each bunch to derive a forecast for the output in tons. OMP 10.0 supports two fundamentally different methods for calculating this bunch weight (see figure 8). Both options have some advantages and disadvantages and it is up to you to choose which calculation method is best suited for your plantation.

The option “historical ABW by palm age” is the calculation that was used in OMP 9.3. Here the program uses the historical average bunch weight for the palm age of each block. All blocks with the same palm age therefore use the same bunch weight during the forecast. The advantage of this method is that it is typically averaged over a lot of data and is thus not sensitive to data entry mistakes or short term fluctuations in data. The disadvantage is that the average being calculated over all blocks and all years in your OMP database can mean that the predictions are distorted by old data. Furthermore, predicted production for the same months can change even without editing any of the BBC data explicitly, as the ABW averages are changed by new production data as time goes on. This can be slightly confusing as printing the same BBC forecast report at different times can lead to different forecasted tons.

The new option “ABW from previous month from same block plus expected monthly increase” does not rely on averages over many blocks. Instead, for each block the program looks up the actual ABW for that specific block in the month before the census (month x-1). The ABW typically increases over time as palms get older, the forecast average bunch weight for months x+1 to x+4 is then calculated by adding the expected monthly bunch weight increase on to the previous month’s value. For the monthly increase, one possibility is to enter a fixed monthly increment directly on the crop forecast settings page. Alternatively, the expected monthly increase can be calculated based on the ABW profile by palm age modulated by the expected monthly ABW growth rate entered by land class in the OMP-DBMS picker definitions. This option allows for more detailed modelling if you have strong seasonality in your ABW growth rates or large differences between different land classes. The main advantage of the new calculation option is that the ABW is always based on the most recent actual ABW data in each block, so that this is not distorted

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by old data or by other data from blocks in completely different parts of your estate. The main disadvantage is that it is susceptible to outliers, so a mistake in calculating the ABW in a single month in one block can throw that block's production forecast off.

The final option "adjust historical ABWs using bunch loss rates" can be used for the case where you have significant bunch losses (i.e. a difference between the number of bunches harvested and those delivered to the mill), and the number of bunches entered in OMP production data is the number of bunches harvested. In this case, the historical ABWs calculated by OMP will be calculated by dividing the weight of fruit at the mill by the number of bunches harvested in the field, so must be corrected by the bunch loss factor.

The settings discussed above change the way the crop forecast is calculated. In addition to this, we have completely recoded all data analysis forms and reports in OMP Crop Forecast and have implemented global filtering throughout the program. In all cases the underlying calculations were standardized and updated to include the new settings, and in many places the design of the forms and reports was improved or clarified.

In OMP Fertilizer Planner, critical leaf or rachis nutrient levels can now be used directly in rules or dose formulae. This makes it much easier to define rules for dose application if leaf analysis values are below a critical bound. In OMP 10.0 we have added the option of saving and loading templates for immature and replant programs. In particular, it is even possible to load templates for immature and replant programs from other OMP 10.0 databases belonging to different estates. This is particularly useful in order to share settings between different estates in larger plantation groups. Finally, we have implemented translation to Spanish and Indonesian throughout the OMP Fertilizer Planner. Conditional formatting for zeros has been implemented on all data analysis forms and reports, in order to make them easier to read by letting non-zero values stand out more.

The OMP Field Survey add-in gives users a huge amount of flexibility in designing their own questions, expressions and survey types. A flipside of this flexibility is that it can be difficult to keep survey definitions in sync between different estates in a group. One thing that was repeatedly requested by our users in previous versions of OMP Field Survey was some kind of system to copy survey definitions between different OMP installations. In OMP Plantation 10.0, we have solved this issue by implementing a system to import definitions from a definitions file that is similar to the way OMP-FS definitions are sent to the smartphone app.

As mentioned at the beginning of this article, this is just a selection of the new features and additions in OMP Plantation 10.0. Please refer to the dedicated OMP 10 What's New document that we will send you as part of the upgrade for further details.

Survey types

Source ID	Description	Import as	Status
AS_PD_Monitoring	Default pest and disease monitoring survey by Agrisoft and TCCL.	AS_PD_Monitoring	
AS_TCCL_FieldAuditImmat	Default field audit immature survey by Agrisoft and TCCL.	AS_TCCL_FieldAuditImmat	Add
AS_TCCL_FieldAuditMat	Default field audit mature survey by Agrisoft and TCCL.	AS_TCCL_FieldAuditMat	
AS_TCCL_FruitQuality	Default fruit quality assessment	AS_TCCL_FruitQuality	

Figure 9: Default OMP-FS survey types developed with TCCL.

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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.

Field work module

- Flexible definition of field upkeep jobs and their expected requirements in terms of labor, equipment, materials and fuels
- Grouping of blocks into field upkeep groups that follow a similar job cycle
- Scheduling wizard for field upkeep tasks to ensure efficient rotation of labor
- Full recording of actual field work carried out and any labor, equipment, materials and fuels used
- Actual vs budget comparison for field work inputs
- Full transparency of all physical cost drivers for field work
- Capture of fuel usage for field work with detailed breakdown by task.

This and that

- Histogram chart for distribution of permanent site characteristics
- Change of some bar charts to line charts for better readability
- Block-level field for general harvest method used in this block
- Add grouping level by field on monthly round length report
- In BBC, add option to enter the monthly distribution for crop ripening on division basis
- Add option to specify whether age in year of planting should be counted as 0 or 1
- Add “Biopesticide” as a pest control type option

OMP Mapper

- Completely new standalone thematic mapping application
- Independent of GIS host programs like ArcGIS and MapInfo
- Mapping using user-defined thematic ranges for all numeric parameters
- Point maps for geo-referenced OMP Field Survey results
- Continued support for custom background layers and exporting to PDF or Google Earth
- Potential options of downloading satellite imagery including spectral imagery