



Agrisoft Systems NEWSLETTER

Fortieth edition, Jan. — Mar. 2022

Message from the Management

Yield improvement with OMP

Dear Customers and Friends,

The main design aim behind the OMP program has always been to provide a tool to support yield improvement and increased efficiency in oil palm plantations. Yield intensification in a large-scale plantation requires joint efforts from the entire management and agronomy staff. OMP provides a variety of tools for different facets of this problem:

- Field surveying tools to help implement regular surveys for control of field upkeep standards, crop quality, harvesting losses and pest or disease incidence.
- Overview reports, GIS maps and “actual vs recommendation” reports to help field managers in their day-to-day job of ensuring that regular tasks such as fertilizer application, herbicide spraying and harvesting are carried out on schedule.
- Historical yield analysis tools to help the agronomy department review and improve company SOPs e.g. for field upkeep, pest control, replanting etc.
- A fertilizer planner tool to help create cost-effective and block-specific fertilizer recommendations.
- Yield gap analysis tools to identify underperforming blocks and drill down to identify the root cause.

The yield of individual blocks in a given group is usually distributed in a bell-shaped curve, and even in a well-run plantation there are typically some individual “straggler” blocks at the low end of the yield spectrum. These underperforming

blocks are the “low hanging fruit” in terms of yield improvement programmes, as they provide the greatest scope for yield increases. A key task for agronomists is therefore to identify blocks that are underperforming in this sense.



The classical approach to this problem is by looking at the so-called “yield gap”, which is the difference between a block’s actual yield and its potential yield. In this approach, it is necessary to estimate each block’s potential in the first place. In OMP, each block is assigned to a land class. For each land class, it is possible to enter a yield potential profile. Yield profiles can be built up based on the results of fertilizer experiments, best management blocks, or reference to the literature. Once yield potentials have been defined, yield gaps (site yield potential minus actual yield) are calculated for each block based on the yield profile for the respective land class. The OMP program contains a variety of reports and forms that allow the agronomist to identify the blocks with the largest yield gaps for further analysis.

Of course, for this approach it is essential that realistic site yield potential profiles have been entered for each land class and that blocks have been assigned to land classes correctly. Where no suitable trial block data is available, it can be difficult to agree on suitable yield potentials and



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there is a danger that field managers reject responsibility for closing yield gaps if they feel that targets are set too high.

A different approach, which does not rely on having defined the yield potential beforehand, is to look at the 5% or 10% best and worst blocks in a set of similar blocks. For such analysis it is important to set a filter to select blocks where yield can be compared under the condition of *ceteris paribus* (i.e. all other factors except the ones under consideration are the same). In laymen's terms, we aim to compare "apples with apples" and "oranges with oranges". To do this, we must set a filter to identify a sub-set of blocks by fixing the values of the independent variables (e.g. palm age, planting material, density, topography) that are known or expected to significantly affect yield. Notice that independent variables tend to be parameters that cannot be affected by management. The filter settings required will differ in each location, depending on site conditions. For example, soil depth may be an important independent variable in one location whilst planting density may be an important independent variable in another location.

Once a suitable filter group has been established, one can compare the yields of the best and worst blocks in the group. If a significant yield difference is found, it is useful to look at average values of the key yield drivers within the sub-groups of the best and worst blocks. In this way, we can start to get an idea of which factors might require attention in the worst blocks. For example, they may exhibit significantly lower leaf nutrient levels or longer harvesting rounds than the best blocks. One should also drill into the data of each of the worst blocks individually because it is of course also possible that different

blocks are underperforming for different reasons (so that this is not necessarily visible in the average value of a certain parameter in the worst blocks group).

The next step would be to carry out field audits to assess all standards of upkeep and harvesting whilst reviewing the block level data in the worst blocks. Field audit data can be collected conveniently using the OMP Field Survey app using the predefined survey types. Some of the results of the field audit can be imported directly into OMP. If the field audits confirm the reasons for the underperformance suggested by the OMP data, new recommendations can be given out to the field management team to correct these issues and close the corresponding yield gap.

The upcoming version of OMP contains new analysis features specifically for the type of "best and worst" analysis outlined above. A more detailed preview of this new version is provided in the feature article in this newsletter.

Yours sincerely,

Max Kerstan





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Preview

Preview: OMP Plantation 10.2

In this article, we provide a preview of some of the changes and additions that you can look forward to in the next upcoming release OMP Plantation 10.2. As usual, our customers with active maintenance and upgrade agreements (MUAs) will receive this version upgrade at no additional cost.

The focus of the new release lies on providing additional data analysis functionality to help identify underperforming blocks and the reasons for this underperformance. This is a crucial task for agronomists in plantations looking to implement yield intensification programmes, as low-yielding blocks offer the greatest scope for yield improvement. As already discussed in the first part of this newsletter, rather than trying to estimate a yield potential curve and thus an absolute value of the yield gap for each block, a pragmatic alternative is to simply look at the best and worst performers within groups of blocks with similar characteristics. The new release adds a new report and data analysis form for this kind of analysis.

Due to space constraints and in order to provide logical access to the various topics, we have split the menu section related to Production & Harvesting into two sub-points. The section "Actuals" contains forms and reports relating to entry, monitoring and reporting of FFB output, bunches and yields at various spatial and time levels. The section "Analysis" contains forms and reports that aim to help you identify the reason behind different block performance, such as correlations between production and other parameters.

The idea behind the new report "Best and worst blocks: summary" is that the user should first use the filter to restrict to a set of blocks with comparable base characteristics (for example, plateau yield phase blocks). The report contains a summary section which contrasts the aggregated values of production and various yield driver parameters amongst the subsets of best and worst performers in the group with the overall average of the group (see figure 1). By looking for param-

OMP Report – Summary of best/worst performers according to Estate																									DEMO					
Filtered by: Age = 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7																														
Year: 2017																									Agrisoft Demo Estate					
Summary																														
Production and harvesting										Site characteristics				Water supply 2017				Water supply 2016				Planting, palm stand			Field upkeep					
YP	Y	YG	ABW	BN	HR	RdL	Prod.		CR	LC	ST	STx	TP	PLU	R/I	WD	DM	SMT	R/I	WD	DM	SMT	PM	Age	SPH	PH	Drn.	Pu.	HA	
t/ha	t/ha	t/ha	kg	b/p	d	t/md	ha/md			mm	mm	mt	kPa	mm	mm	mt	kPa	yr	p/ha	m										
Best 5	37.3	34.1	3.3	28.8	9.1	143	14	2.27	1.92	2.6	1.0		2.4	2.0	2573	-102	2	0	1885	-250	2	0	3.6	18	130	6.6	3.8			
All	31.2	28.0	3.2	24.3	8.9	380	13	2.02	2.13	1.2	1.0	0.5	2.3	2.2	2585	-139	2	0	1989	-274	2	0	6.9	16	130	5.2	3.9	4.0		
Worst 5	29.2	24.3	4.9	18.2	10.3	130	15	1.66	1.77	1.0	1.0		2.4	2.0	2501	-147	2	0	2276	-229	2	0	7.0	14	130	3.9	4.0			
Leaf analysis [% DM, mg/kg]; Deficiency scores										Crop residues [t/ha]			Nutrient application (inorganics) [kg/p]						App. score		Soil deficiency			Count						
N		P		K		Mg		B		EFB	Pom	Dec	N	P2O5	K2O	MgO	B		Inorg.	Org.	N	P	K	Mg	rcs					
L	Rc	D	L	Rc	D	L	Rc	D	L	D	A	R	A	R	A	R	A	R												
Best 5	2.45	0.60	0	0.148	0.098	0.92	1.46	1	0.25	0.07	0	16	1														5			
All	2.60	0.60	0	0.157	0.099	1.01	1.50	1	0.28	0.08	0	17	0	84	470	0	0	0	0	1.0	1.3	0.4	0.5	0.5	2.2	0.2	0.2	0.016	0.027	267
Worst 5	2.58	0.53	0	0.171	0.101	1.10	1.53	0	0.28	0.07	0	18	0	0	0	0	0	0	0	0.8	1.2	0.2	0.5	0.2	2.0	0.2	0.2	0.017	0.028	5

Figure 1: Summary section of report "Best and worst blocks: summary"



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Preview

eters that display a significant difference in values between the different subsets we can get an idea of what might be the biggest influences on yield and yield components in this group. For example, in figure 1 we see that the “Land class” score amongst the best blocks is 2.6 while the worst blocks have an average score of 1.0. This suggests that in this specific example we should adjust our filter and repeat the analysis for individual land classes.

Further down the page, the report displays the block details of the individual blocks in the best and worst subsets (see figure 2). This allows the user to immediately identify the relevant blocks and get an idea of whether the differences are driven by individual outliers. At the end of the report, we also include a definitions section that contains information on the relevant picker definitions and system settings, to help the user make sense of aggregated scores of picker-type parameters (such as the land class in the example above).

As usual we have tried to make the report as flexible and powerful as possible by including a number of options and settings that you can use to customize the report. The relevant settings

form when opening the report is shown in figure 3. First of all, it is possible to specify a grouping and subgrouping level. With this option, it is possible to print out the best/worst analysis reports for multiple “groups” (e.g. multiple land classes and palm age groups) at the same time without having to use the filter to restrict to individual values of these parameters one after another. Furthermore, it is possible to specify which portion of the group should be included in the best and worst subsets, with options of specifying a fixed number of blocks or using a specification like best/worst 10 % of blocks. For the ranking parameter you can choose between options including the yield, yield gap, bunch weight, bunch number and harvester productivity.

The new data analysis form “Best and worst blocks: details” works on a similar premise as the report outlined above by looking at the best and worst blocks ranked according to a yield parameter of your choice. In contrast with reports, it is not possible to include sub-grouping on forms, so you must use the global filter to restrict to a dataset with sufficiently similar characteristics that a yield comparison is reasonable. The aim of this form is to provide further details on the individual blocks that make up the best and worst sub-

Best/worst 5 blocks ranked by Yield [t/ha]																														
Division	Block	Field	YOP	Age	SPH	Production data				Nutrient application (inorganics) [kg/p]								Leaf analysis [% DM, mg/kg]; Def scores												
						Y	YG	ABW	BN	HR	N		P2O5		K2O		MgO		B		N		P		K		Mg		B	
						t/ha	t/ha	kg	b/p	A	R	A	R	A	R	A	R	A	R	L	D	L	D	L	D	L	D	L	D	
Best																														
Center D01	MT07	303D	2000	18	129	35.0	3.7	29.8	9.1	28	1.4	1.6	0.0	0.5	0.0	2.4	0.2	0.3	0.024	0.028	2.52	1	0.150	0.48	1	0.17	0	18	1	
Center D01	MT04	303A	2000	18	128	34.4	4.3	28.7	9.4	28	1.6	1.6	0.0	0.5	0.0	2.4	0.3	0.3	0.000	0.028	2.68	0	0.160	0.99	1	0.33	1	14	1	
Center D01	MT06	303B	2000	18	129	34.4	4.3	28.6	9.4	29	1.5	1.6	0.0	0.5	0.0	2.4	0.2	0.3	0.000	0.028	2.32	0	0.136	0.97	1	0.21	1	17	1	
Center D01	MT07	301C	1999	19	136	33.6	3.3	28.8	8.6	27	0.8	1.2	0.0	0.5	0.0	2.4	0.2	0.3	0.000	0.028	2.34	0	0.146	1.22	1	0.24	0	15	1	
Center D04	LL09	127A	2000	18	129	33.1	0.9	28.2	9.1	31	1.0	1.2	0.4	0.5	0.0	2.4	0.2	0.3	0.000	0.028	2.38	0	0.146	0.96	2	0.29	0	17	1	
Worst																														
Center D05	SD11	211C	2000	18	128	25.0	5.0	24.2	8.0	25	0.5	1.2	0.3	0.5	0.0	1.8	0.1	0.1	0.000	0.028	2.51	0	0.159	0.99	0	0.25	0	19	0	
South D02	LP04	418C	2009	9	133	25.0	3.6	12.6	14.9	26	0.8	1.2	0.0	0.7	0.0	1.8	0.2	0.3	0.024	0.028	2.61	0	0.198	1.33	0	0.31	0	20	0	
Center D02	PS10	116F	2002	16	129	24.5	6.1	23.0	8.2	27	1.0	1.2	0.3	0.3	1.6	2.4	0.2	0.3	0.025	0.028	2.63	0	0.150	1.01	1	0.28	1	17	1	
Center D01	MT09	305C	1999	19	127	24.5	4.6	24.4	7.9	27	1.1	1.2	0.4	0.5	0.0	2.4	0.3	0.3	0.025	0.028	2.41	0	0.161	1.04	1	0.24	1	15	1	
South D02	LP04	418D	2009	9	133	22.4	6.2	12.3	13.7	25	0.8	1.2	0.0	0.7	0.5	1.8	0.2	0.3	0.019	0.028	2.72	0	0.186	1.15	0	0.30	0	22	0	

Figure 2: Block details section of report "Best and worst blocks: summary"



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Preview

Open report

General report settings

Year: 2017

Group by: Estate

Subgroup by: Planting year

Show data for:

Best/worst: 5 Blocks

Ordered by: Yield [t/ha]

Include block details

Organic fertilizers to display

Fertilizer	Abbreviation
EFB	EFB
Pome	Pom
Decanter Cake	Dec

Figure 3: Report settings

sets. We use a datasheet view layout that allows you to scroll to the right to be able to display far more parameters than can usually be fit onto a single form or report (see figure 4). As usual for forms, you can work with the data dynamically

using local filtering and sorting on any of the columns, and the function to export form data to Excel can be used to extract the data for outside analysis.

Another addition in OMP Plantation 10.2 is the possibility to define a certain fertilizer application method as a “failed” application where the nutrient inputs are to be ignored. This gives users the possibility to account for cases where fertilizer was in fact applied in the field, but something went wrong and the nutrients in the fertilizer do not become available to the palms. For example, this could be the case if a flood happens directly after the fertilizer application that washes away the fertilizer, or if the fertilizer was not applied in the right location.

In addition to the points discussed so far, the OMP 10.2 release includes a number of other smaller improvements and bug fixes. As usual, users will receive a “What’s new” document that provides a more complete list of changes as part of the upgrade process.

Best and worst blocks

Year: 2017 Best/worst: 5 Blocks Ordered by: Yield [t/ha]

Options Apply

Best

Division	Field	Block	Yield actual [t/ha]	Area [ha]	Area in yield [ha]	Area fert. [ha]	Plant stand in yield	Plant stand fert.	Planting year	Palm age [yr]	Plant stand [p/ha]	Planting mat
Center D01	MT07	303D	35.0	33.70	33.70	33.70	4355	4355	2000	18	129	ASD
Center D01	MT04	303A	34.4	43.46	43.46	43.46	5563	5563	2000	18	128	ASD
Center D01	MT06	303B	34.4	37.29	37.29	37.29	4792	4792	2000	18	129	ASD
Center D01	MT07	301C	33.6	31.86	31.86	31.86	4341	4341	1999	19	136	ASD
Center D04	LL09	127A	33.1	42.35	42.35	42.35	5461	5461	2000	16	129	Soctindo

Worst

Division	Field	Block	Yield actual [t/ha]	Area [ha]	Area in yield [ha]	Area fert. [ha]	Plant stand in yield	Plant stand fert.	Planting year	Palm age [yr]	Plant stand [p/ha]	Planting mat
Center D05	SD11	211C	25.0	31.94	31.94	31.94	4104	4104	2000	18	128	Marhat
South D02	LP04	418C	25.0	18.34	18.34	18.34	2443	2443	2009	9	133	Marhat
Center D02	PS10	116F	24.5	5.14	5.14	5.14	664	664	2002	16	129	Marhat
Center D01	MT09	305C	24.5	39.18	39.18	39.18	4975	4975	1999	19	127	Marhat
South D02	LP04	418D	22.4	24.03	24.03	24.03	3193	3193	2009	9	133	Marhat

Set filter Age = 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7

Figure 4: Data analysis form "Best and worst blocks: details"



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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.

OMP-BBC

- Define monthly distribution by division / field rather than centrally for the whole estate
- Option of entering own predicted average bunch weight (ABW) values
- Base historical ABW calculation on average multiple previous months
- Exclude outlier values in previous ABW calculations
- 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 report for forecasted vs actual bunches per individual month

Data entry & new fields

- Additional free user-definable marker fields
- Dedicated field for block status in best management practices (BMP) projects
- Field for depth of water table
- Field for relative humidity under climate data
- Field for block soil gravel content
- New point type “palm row” in OMP Field Survey
- Allow null values for picker scores to reflect 'no data'
- Option of entering default values in picker definitions tables

OMP Group

- Improved system of pulling in data from multiple sites for better speed
- Better handling of group database configuration in multi-user settings
- Option of leaving out the division name prefix
- Support for grouping by estate on various data analysis forms and reports

