Agrisoft Systems
NEWSLETTER
Forty-fifth edition, Apr.— Jun. 2023

Message from the Management

Capturing data for OMP

Dear Customers and Friends,

As an agricultural management information system, it is clear that the utility of the OMP software depends critically on the availability, reliability and accuracy of the data that is fed into the system. Setting up and maintaining or improving the data capture and entry processes for data that needs to be recorded on a regular basis is one of the most important tasks for any company looking to get the most out of OMP. OMP covers a wide range of topics, and different data capture processes are appropriate for different types of data. Furthermore, each plantation company will have its own specific circumstances and challenges that affect how and when each type of data is recorded. This means that there is no simple short and universal answer to the question “How to capture data for OMP?”. Nevertheless, it is of course possible to make some general recommendations.

The single most important parameter to record accurately is the bunch and loose fruit production per block. Ideally, this data is captured directly at the weighbridge and then transferred into the OMP database electronically to avoid additional manual data entry or calculations. This newsletter contains a feature article where we discuss the associated challenges in more detail.
Probably the simplest to capture accurately is data corresponding to physical parameters that can be measured unambiguously, without requiring any subjective human valuation. Ideally, this can even be done automatically with suitable sensor equipment, removing any ambiguity and potential of human error. In the context of OMP, this mainly applies to climate and weather data that can be captured using automatic weather stations or suitable instruments like soil tensiometers.

For data such as leaf and soil analysis data (leaf and rachis nutrient levels, soil nutrient levels and physical properties) or vegetative growth data (palm height, rachis length, PCS etc), there are also standard well-defined measurement processes. Especially the lab results often give the impression of being very accurate due to their “scientific” nature. However, it is very important to be aware that the data will only be accurate if the right protocols are followed and data collectors are trained appropriately. For example, leaf and soil samples or vegetative growth measurements must always be taken at the same sample palms or locations each year, the samples must be prepared appropriately, the correct frond must be sampled and so on. It is also very important to cross-check the accuracy and reliability of the laboratory itself, as this can also vary

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widely and in the worst case can result in worthless or even misleading data.

Other agronomic parameters are better suited to a more qualitative scoring system. Examples might include field upkeep parameters (pruning, status of harvest paths and palm circles, drainage etc) or the severity of a pest or disease outbreak. To achieve comparable data, it is vitally important that the company TSD/agronomy department defines the picker values or allowed scores for each parameter in a consistent way, with clear criteria for each particular score value. This type of data is ideally recorded with the OMP Field Survey app, where the surveyor automatically has the picker definitions to hand and the data restriction is automatically built in. The OMP Field Survey system also allows for custom expressions to convert raw survey data into a qualitative score based on fixed criteria. For example, in a disease survey you could let the surveyors simply count the number of affected palms per block, and then define an expression that assigns a severity score depending on the percentage of affected palms compared to the total palms in that block.

Another type of data that is collected on a regular basis concerns work carried out in the field, in particular application of fertilizers, crop residues and pesticides. The best way to record this data varies depending on the work practices in each plantation and the use of other related software systems such as ERP software. If you have a well-functioning ERP system covering payroll and inventory management, it may be possible to load information like the amounts of fertilizer applied per block and month from that system into OMP. Alternatively, the field managers and supervisors may record this kind of information either in paper or electronic form and pass it to their OMP operator for upload into the OMP system.

In upcoming editions of the newsletter, we will be taking closer looks at some of the typical data recording workflows generally outlined above, starting with the weighbridge production data capture in this edition.

Yours sincerely,

Max Kerstan

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Capturing daily production data by block

Practically all oil palm plantation companies these days who operate their own oil mill use an electronic weighbridge to capture the weight of fruit delivered from the field to the mill. As this data is already available in electronic form, it is usually not too difficult to implement a workflow whereby the daily production data can be imported into the OMP database on a regular basis. We strongly recommend that such a practice be implemented wherever possible.

Importing daily production data into OMP has two main advantages compared to the traditional approach of waiting until the monthly production data had been aggregated, checked and consolidated before importing it into OMP. For one, no additional manual aggregation or calculations are needed, avoiding potential data transcription or calculation errors. In particular, OMP can calculate the harvest round lengths automatically from the daily harvest records, which can be an onerous task to do manually. Furthermore, having daily harvest records in OMP makes it possible to use the various forms and reports in OMP that focus on showing blocks late for harvest and the distribution of harvest round lengths. This can be a very useful tool for field managers, for whom making sure that all blocks are harvested on time is one of the most important day to day tasks.

The daily production data tables in OMP contain the columns specified in table 1. The data marked as “required” is typically available from the data recorded directly at the weighbridge. The additional data in the “optional” columns might be recorded at the weighbridge or it could come from other sources, e.g. from the payroll system or from data recorded by the harvest supervisors themselves.

Weighbridge software is typically built to automatically record the date/time of the weighing as well as the gross and net weights of the truck. There will also be an entry form where the weighbridge operator typically enters some additional information such as the truck license plate number or, most importantly, the source block

Required	Optional
Date	Split of overall weight into FFB and loose fruit, or loose fruit percentage
Source block (identified by estate, division and block name)	Harvester mandays
Total weight of fruit	Area harvested
Number of bunches	Mill name
	Harvest method

Table 1: Columns for daily production data capture

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where the fruit that was delivered came from.

Correctly assigning fruit to the source block is clearly of crucial importance for yield intensification and precision agronomy, as otherwise there is no basis of evaluating and comparing block yield performance. Usually, the truck driver will bring the weighbridge operator a bunch record sheet which lists the source block(s) from which he has picked up fruit. Usually, this bunch sheet should have been prepared by the harvest team supervisor in the field and should include the number of bunches in addition to the source block.

The recording is straightforward in the case where the full truckload came from the same block. However, in most plantations trucks can and should sometimes carry “mixed” loads with fruit from multiple blocks, to avoid inefficient trips with half-empty trucks. In this case, it is important to establish a system to assign the correct proportion of the truck’s fruit load to each of the source blocks. This can be done based on the number of bunches that came from each block, which should be available to the weighbridge operator from the bunch record sheet that the truck driver gives him. The weighbridge software should have an entry form that allows you to enter multiple rows of data for multiple source blocks with the number of bunches for each. The software should automatically use this information to divide up the overall tons from the weighing result to the individual blocks. So the weighbridge operator should only need to type in the number of bunches per source block exactly as on the paper sheet that he gets, and should not need to calculate and type in the divided up weights himself.

The simplest way to divide up the truck load is directly proportional to the number of bunches from each block. This means the weight w_B to be assigned to a given block is calculated as follows:
$w_B = w_T * b_B / b_T$
Here, b_B is the number of bunches coming from that block, while w_T and b_T are the total weight and total number of bunches in that truck (from all blocks). The advantage of this system is that it requires no additional inputs and can be calculated purely from the information contained in that truck’s bunch record sheet. However, it implicitly assumes that the average bunch weight is the same for all the contributing blocks. In cases where the true bunch weight varies significantly between blocks, this calculation method will incorrectly assign the fruit weights to the blocks. Therefore, when using this calculation method mixed fruit loads should only be collected from blocks with very similar characteristics and palm ages.

A more refined calculation method uses an extra “bunch weight calibration” table within the weighbridge software. This table should contain the list of blocks and an "average bunch weight calibration" (ABWCal) value for that block. The ABWCal values in this helper table should be updated manually every once in a while, when you get a "pure truck" which has only fruit from a single block. The weighbridge software can then allocate the weights to the source blocks accord-

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ing to the ratios of the ABWCal values. So for example, say a truck comes in with bunches from three blocks A, B and C. The bunch numbers from each block are taken from the bunch record sheets, so you have the numbers bA, bB, bC, plus the total weight wT in the truck. Then the software would assign:

$w_A = w_T * (b_A * ABWCal_A)/(b_A * ABWCal_A + b_B * ABWCal_B + b_C * ABWCal_C)$
$w_B = w_T * (b_B * ABWCal_B)/(b_A * ABWCal_A + b_B * ABWCal_B + b_C * ABWCal_C)$
$w_C = w_T * (b_C * ABWCal_C)/(b_A * ABWCal_A + b_B * ABWCal_B + b_C * ABWCal_C)$

The advantage of this method is that it accurately assigns the weights to each block, even in the case where the source blocks have very different characteristics and very different average bunch weights. However, this comes at a cost of slightly added complexity in the weighbridge software of having to maintain this helper table of calibration bunch weights per block.

Whichever calculation method you use in the end, the important thing is that the weighbridge operator only needs to enter the information that he receives from the bunch record sheet that the truck brings (number of bunches for each source block), and that the software does the rest of the calculations for dividing up the fruit weights.

The additional optional information listed in table 1 can be obtained from different sources, depending on the reporting workflows typically used in your plantations. One option might be that the harvesting supervisor writes down additional information like area harvested and number of mandays on the paper record that is sent with the fruit, and the weighbridge operator enters the data into the weighbridge database. Alternatively, the information might be recorded in a separate workflow in the company payroll/ERP system. A bespoke query can then be set up to pull the data from the various contributing systems into the OMP database.

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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.

Automatic production data aggregation

- Triggers to automatically update monthly production data tables when daily production data is entered or edited
- Handling to support even the case where daily data is edited by external query/script
- When monthly production data is entered or edited explicitly, the corresponding daily data in that month is updated to avoid any possible inconsistencies between the two data sets
- Skip round length calculation in rounds where monthly data was entered explicitly
- Handle recalc and updating of calculated columns in daily production data using triggers
- Handle assignment of harvests to rounds in back-end database

Field work and resource use module

- Budgeting for regular field work tasks like weeding, pruning, fertilizer application etc.
- Flexible definition of jobs with expected rates of usage of resources like fuel, equipment, material and labor
- Scheduling wizard to generate field work budget based on desired number of rounds and total area to cover in one cycle
- Recording of actual areas covered by job, block and date and comparison vs budget
- Recording of actual resource use and comparison vs budget
- Integration of fertilizer and pesticide application data
- Assignment of blocks with similar characteristics to “field work groups” which have similar field work plans

General improvements

- Handling for overlength picker definition values in special cases
- Option to exclude block details on block agronomic summary report
- Add totals lines for averages on DA form vegetative growth
- Extra option for fourth display parameter on DA form month/YTD production
- Add yield on report monthly production by division
- Add option to show rainfall chart totals over whole estate, not just one division
- Extra grouping options for fertilizer DA forms and reports