

HARVEST plus
Reaping success worldwide

Processing & Maintenance



iSmart Business Solutions Pvt Ltd.

IT Park, Plot No. 16 A, 'B' Block,
Cochin Special Economic Zone,
Kakkanad, Kochi, Kerala, India
Ph: (91) - 484 - 2413181
FAX: (91) - 484- 2413243
E-mail: ibspl@ibspl.com
URL: www.ibspl.com

Microsoft
GOLD CERTIFIED
Partner





Index

Plant Maintenance System.....	3
Fleet Management System.....	7
Outgrower System.....	10
Weighbridge System.....	13
Rubber Processing System	17
Palm Kernel Oil Factory System.....	21
FFB Processing System.....	25
Fractionation and Refining Factory System.....	28
Tank Farm Management System.....	32
Seed Production System.....	35



Plant Maintenance System

The HARVEST *plus* Plant Maintenance System takes care of all the operational details related with the engineering section of an enterprise. The functioning of plants can be maintained through this system. You can capture the estate or division details in which the plants are located. It provides the workflow control for the major operations like job card, out sourcing, time sheet schedule, and machinery process to control the logistics and provide the management with in depth analysis of cost and management of resources.

It integrates all the operations of the logged in engineering unit to give an overall view. You can schedule the jobs to be done in the plant in a specified date. The departments in the plant can raise job requisitions, which is to be allocated after sanctioning. It calculates the labour cost of the opened job cards created for doing the requested jobs. The costs are updated to the general ledger. Also the jobs in the plant can be out sourced. This system keeps track, of the details of the machines used in the plant, mainly for reporting purpose.

It integrates with other sections like Materials Management, Financials and Administration to centralize processing. It also gives additional provisions required to optimize day-to-day operations like checklist entry and its status maintenance, scheduling and breakdown maintenance.



Main Features of Plant Maintenance System

The functioning of the engineering section of an enterprise can be done through the Plant Maintenance System.

The main features of this system are:

1. **Expenses incurred are distributed among various machineries:** The scope of Plant Maintenance System is to distribute the expenses incurred in the engineering units like wages to the employees etc. to the various estate machineries which had under gone maintenance work in the unit. It captures the data from estate/division on which the plant is located and facilitates the functioning of the plant.
2. There is the provision to create multiple sections under the engineering unit/plant. You can also set the in charges for these sections with in the corresponding engineering units or plants.
3. This system has the provision to create the job items under plant /engineering unit and we can tag sections with the job items. Assets, machinery, equipment and vehicle together are termed as job item, which need maintenance. The **Job Item** screen is used to define these job items in the plant or administrative unit to perform the day to day activities.
4. This system helps to define the skill category in engineering system and allocate charge out rate against that. This helps in identifying the skills needed for doing a particular task. This rate is used for the costing of job cards.
5. **Jobs are divided into tasks.** In an engineering unit, a job can be divided in to different tasks. There is the provision to define tasks in the section, via engineering unit. The tasks involved will vary for each kind of service. You can also define the assets, procedures followed, materials used, the man days utilized, and the tools and safe guards used to perform the task, through this system.
6. **Generate service schedules:** This system helps to prepare maintenance schedule of machineries in the engineering unit and outside the engineering unit/plant. According to this schedule there is a provision to generate job requests/job cards, and alerts. There are mainly two types of schedule handling in this system:



- Routine Service
 - Routine Inspection /Checks
7. **Service Request:** Jobs are done based on the requests for the job item made by the concerned departments. When a request for repair is reported with the engineering unit, further action is taken on the request only after verification of request. There are different ways to create the job request based on the request source. The request source types are:
- Engineering unit
 - Administrative unit
 - Party
 - Schedule
 - Plant
8. **Job card:** This is the primary document for doing any maintenance work in the engineering unit. All the major works will be carried out depending on this job card only. You can outsource the work also.
9. **Cost Estimation:** The cost for doing a job based on the job cards prepared is calculated and distributed against each of the machineries. The cost is estimated corresponding to the tasks done, man hours utilized, material used and service charges. The total of these will be termed as the estimated cost for the request. There are two methods for calculating the labor cost:
- Based On Skill Category Rate
 - Based On Workshop Hourly Rate
10. **Facilitates SIR generation:** For all the registered jobs the respective engineering unit housing clerk can allocate mechanic / worker to execute the task. The system will generate the corresponding stores issue requisition in the Inventory Control System, based on this material allocation.
11. The attendance details of the workshop employee can be entered, with respect to each Job card and task.
12. There is the provision to enter the material consumption details and return the job cards.
13. Additional expenses incurred to job cards can be tracked.



14. This system facilitates doing some small works with out job card.
15. **Facilitates entering Disciplinary Actions:** This system keeps track of the actions taken against an employee for violating the operating procedures of the machinery assigned to him.
16. Provision to capture the day to day working of particular machinery in the engineering unit. This information is used to giving alert for various service schedules.
17. There is the provision to create a Job Reception, Job Release, Other Expenses, Machinery History, etc. based on the plant/engineering unit/admin unit.
18. **Maintains Accident Log Book:** Accidents may happen to the drivers or operators of the company during working hours. The accident details such as date and time on which the accident happened, type and the plant or engineering unit in which the accident happened etc., are maintained in all the plants to keep track of all the accidents.
19. **Report Generation:** Various reports are incorporated in this system after analyzing the requirements of the end users. The main reports are Service schedule, Asset History, Costing Report, Bills of Material, etc.



Fleet Management System

The HARVEST *Plus* Fleet Management System provides the efficient way of managing the running cost of the vehicles. This includes the accumulation of running, operating and maintenance cost of an asset and distributing the same on the basis of the usage. Transport is one of the important areas where assets are used and cost is distributed as per the usage.

Through this system you can categorize vehicles and can define specifications for vehicles. The notifications for the expiry date of tax and insurance could be scheduled. Requisitions for vehicles can be made for usage in a specified period. The vehicles can be allotted after sanctioning the specified requisitions by an authority. Daily logs can be kept containing the usage details of vehicles.

You can also record the maintenance details of vehicles through this system. The fuel and oil consumption details of the vehicles can also be entered. Disciplinary actions can be taken on the damage of vehicles. Various reports can be generated in this system.



Main Features of Fleet Management System

The Fleet Management System facilitates the functioning of transport system in the company. This system automates and thus simplifies all the functions related to transport and workshop.

The major features of this system are listed below:

1. This system provides provision to tag machinery to its usage and the standard performance of the machinery.
2. The vehicles and machineries can be categorized based on their usage, size etc. A hierarchy of vehicle classes can be created and maintained.
3. The expiry date of vehicle tax and insurance can be notified through either auto generated reports or passing automatic journals.
4. This system records the transport activities within various locations.
5. **Vehicle Requisitions:** The vehicle requisitions can be made, in which the procedures of vehicle requested for usage in a period can be entered. The vehicles will be allocated upon sanctioning.
6. The vehicle allocation can also be done without requisition. When there is a request for a particular vehicle and if that vehicle is already been allocated, then system will be able to suggest with the available same type of asset.
7. **Job Cards:** The Job cards can be created containing details of job requests. All the major works in the work shop will be carried out depending on this job card only.
8. **Fuel and Oil Consumption:** The details of fuel and oil consumed by the vehicles related to a job can be recorded.
9. **Daily Log:** The Daily log of the machinery is used to track the day to day use of the vehicles. With this you can also provide inputs to the employee remuneration calculation.
 - The total running hours and kilometers of vehicles in a day will be recorded and the corresponding running cost can be calculated.



- The running cost distribution is based on the daily log entries in case the vehicles are allocated for a short period.
 - If the vehicles are allocated for long period, it is not mandatory to have daily log entries and the cost will be distributed on the basis of its allocation.
10. The details of vehicles hired from outside contractors can be entered through this system. The company can enter into a contract with the contractors for the specified period. The cost of the contract and also the details of charges to be deducted as maintenance cost can be entered, if any.
 11. **Asset Allocation Codes (AAC):** The asset allocation codes are the codes related to the asset accounts of this system, which is linked with the specific account and analysis codes. The day-to-day charging will be done to these codes. The expense journals will be posted to the General Ledger System with the help of this linking.
 12. **Document Management:** This system keeps track of the various documents related to the machinery / vehicles.
 13. You can run processes which compute the cost for each trip and charge the cost to the beneficiary. There are various options to compute the unit rate, which constitutes the basis for getting the cost for each trip. This can be fixed based on the type of the machinery and cost distribution policy.
 14. **Report Generation:** You can generate reports for viewing the cost for each trip and performance of machineries in terms of fuel efficiency and out put.



Outgrower System

The HARVEST *Plus* Outgrower system is designed to customize the activities related to the contract with the outgrowers. The outgrowers are the party that supplies the raw material for the manufacturing of the oil palm for the specific companies where in they utilize their resources for the production of fresh fruit bunches.

Through this system you can define the categories for out growers and can group various out growers into these categories. You can also define the market rate of raw materials with respect to its effective date.

The details of the contract can be prepared, sanctioned and cancelled through this system. Also the details of the renewing contract can be prepared, sanctioned and cancelled. You can maintain payment advice memos for the contracts prepared through this system.

You can also calculate and print the periodic crop projection based on the delivery schedule of out growers. The system has the provision to generate the reports for the corresponding transactions that takes place.



Main Features of Outgrower System

The system maintains all the contract details related to out growers of the company.

The major features of this system are listed below:

1. The **Category Definition** screen is used to define the various categories of out growers based on different factors such as location of supplier, quality and the type of the materials supplied to the company etc.
2. This system is designed to customize the activities related to the contract made with the out growers. The details of the contract can be prepared, sanctioned and cancelled.
3. The **Outgrower Categorization** screen is used to categorize the specific outgrowers or the smallholders based on different category criteria such as location, material quality, material supply etc and based on the specified category.
4. The market price for the raw material is again subject to changes based on the market trend. The **Market Price** screen is used to define the price for the raw material. The date from which the newly defined market price is in effective can be entered.
5. **Supply Contract:** Through this section the supply contracts can be prepared, sanctioned and cancelled.
 - The **Preparation** screen is used to enter the contracts details for supplying raw materials. You can enter the terms and condition of the contract, bonus details, raw material delivery schedule and payment schedule related to the contracts.
 - A bonus based on the supplied quantity for a month can be paid to the out growers based on the quality of the raw material they have provided. Also we can define the Bonus Rate per KG for the FFB supply during that month.
 - We can also define the additional charges or discounts, payment schedule, delivery schedule and the terms and conditions of the contract while creating the contract.
 - The **Sanctioning** screen is used to sanction or reject the supply contracts entered



through *Preparation* screen. All the unsanctioned contracts as on the specified date will be displayed in the grid. The remarks regarding the sanctioning or rejection can also be entered.

- The **Cancellation** screen is used to cancel the contracts that have been sanctioned. The reason for cancellation can also be entered.

6. **Renewing Contract:** Provision to extend or renew a contract based on the company's policy. This section contains screens which allow you to enter the details regarding the extension of the supply contracts. You can also sanction and cancel the extended contracts.

- Contract nearing completion can be renewed or new contract can be created. The period of the selected contracts can be extended.
- Contract can be renewed only once and modification of contract condition's of the renewed contract to that of the original contract is not possible.

7. The quality and quantity of the good's supplied can be known through the supplier register.

8. A payment advice memo can be generated for the out grower. The **Payment Advice Memo** screen is used to generate a memo based on which the payment is to be made to the outgrowers. The payment to be made to the outgrower is based upon the weigh bridge docket and contract details.

- The journal will be posted in General Ledger System for the amount generated in payment advice memo.

9. **Crop Projection:** Provision to do crop projection based on the delivery schedule mentioned in the supply contract.

10. **Report Generation:** Various important reports can be generated such as *Expired Contract, Contract wise supply Register Summary as well as details, Payment Advice Register Details, and Due for Payment Process* etc.



Weighbridge System

The HARVEST *Plus* Weighbridge System facilitates the functioning of weighbridge installed in a mill or factory of an estate. The weighbridge installed may be a manual or an electronic weighbridge. The various vehicle categories, vehicles and the capacity of materials that can be carried by each vehicle category can be defined in this system. The type of materials weighed and their source or destination can also be tagged through this system. The type of vehicles that can be allotted to a driver can be tagged in this system. The average bunch weights of the crops arriving from own field, block or out grower's farm can be captured here.

You can capture the weight of the material and vehicle arriving for weighment while performing the first weighment and second weighment. The calibration details of the weighbridge and vehicle / cage weight are also recorded. The details of blacklisted vehicle and driver can be specified through this system. You can also track the details of the quality of the crops arriving from own field / block or out grower's farm. Weighbridge system also produces all the desired reports required for monitoring and controlling the system.



Main Features of Weighbridge System

The Weigh Bridge System facilitates the functioning of weighbridge installed in the mill or factory. Incoming and outgoing materials (products) are weighed on weighbridge before they are accepted or dispatched.

The major features of this system are listed below:

1. The weighbridges defined through **Weighbridge** screen can be a manual weighbridge or an electronic weighbridge, as your requirement.
 - Electronic weighbridge measures the weight and converts it in to digital signals and these signals are captured by computer through ports and the data will be stored for analysis purpose. The technical data transfer settings for the electronic weighbridge can be defined using this screen.
 - There is provision to do manual weighing in absence of electronic weigh scale.
2. The HARVEST system can handle more than one Weigh Bridge System for a location.
3. You can set the cut off time for the business transaction, which refers to the start time of a business day.
4. The **Vehicle** screen is used to define various vehicles that come to the weighbridge. It facilitates in ensuring only authorized and known vehicles coming to the weighbridge. You can define the standard tare weight of vehicle. If there is deviation from the defined standard weight, system pops up an alert message.
5. **Linking:** This section contains options, for linking various entities in this system, which helps for the accuracy of the data entry.
 - The **Weighbridge - Material Linking** screen is used to define the materials that can be weighed in the specified weighbridge.
 - The **Vehicle - Material Linking** screen is used to define the materials that can be transported in the specified vehicle.



- The **Material - Source / Destination Linking** screen is used to tag the source/ destination for the specified material belonging to various categories.
 - The **Source / Destination - Material Linking** screen is used to tag the specified source/ destination to the materials belonging to various categories.
 - The **Driver/Helper – Vehicle Linking** screen is used to tag the specified driver/helper to the vehicle belonging to various categories.
6. **ABW:** The details of the average bunch weight of the crops from own field / block defined through this section.
- The **Own Field / Block ABW** screen is used to define the average bunch weight of the crops from the own division or field / blocks for a specified period. If the ABW is defined at the division level, then all the underlying field / blocks would have the same average bunch weight.
 - The **ABW Range** screen is used to define the rate per unit, for the different bunch weight ranges of the crops. Through this option, you can also specify the period for which this rate is applicable.
7. The ABW for out grower can be entered through the **Quality Analysis** screen. Quality analysis is mandatory if the material is coming from an out grower. The details of the fruit bunches arrived from own field / block and out grower’s farm such as grade, average bunch weight can be captured using this screen. The total bunches and loose fruits arrived from the out grower’s farm, the details of the samples and penalties can be entered using this screen.
8. **Locomotive:** Locomotive engines pull the rail cages carrying raw materials. Locomotive type vehicle can be defined in the **Vehicle Category** screen. The vehicles tagged with these vehicle categories will only be populated, in the *Locomotive No* field for which weighment has to be done through “Transaction / Cages Weighing”.
9. You can enter the weighment details of rail cages on special weighbridge, where railway lines are available on weighbridges.
10. In the case of **Locomotive** weighment, tare weight is not measured along with all the weighing. Instead, fixed tare weights of the rail cages and chassis are used.



11. For **Locomotive** weighment, *Trip Number* is generated automatically by this system and it will get reset on every day.
12. User defined vehicle format is given that is done using the regex expression builder.
13. **Blacklisting:** This section contains options, which allows you to blacklist the vehicles or drivers. A vehicle can be blacklisted due to technical reasons such as non calibration of the vehicles in spite of the warnings given by the system or due to wear and tear of the vehicle. A driver can be blacklisted due to their poor service, lack of following the rules and regulation of the company etc.
14. The **Revoke Blacklisting** section contains options, which allows you to revoke the blacklisted vehicles and drivers.
15. Provision to identify vehicles which will be used for Weighing
16. The last calibrated date for each weighbridge and vehicles can be recorded.
17. Inspection is included to identify the unripe and rotten bunches.
 - The **Grade Range Definition** screen is used to define the grade ranges for the items. The maximum percentage of items that are eligible for penalty or that can be rejected can be specified through this option.
 - The out growers penalty details can be recorded through **Quality Analysis** screen of this system.
18. Capable to generate notification messages using Harvest Pop messaging system.
19. **Report Generation:** Various reports are included in the system such as Weighing Docket and Ticket Printing, Raw Material Arrival Register, Turn Around Time, Block wise arrival register, Transporter Register etc.



Rubber Processing System

The HARVEST *Plus* Rubber Processing System facilitates the functioning of crumb rubber factory of the company. This system handles the arrival of raw materials, tracks the inputs to various production lines, processes the raw materials and dispatch the finished goods to various destinations. The quality assurance of the products is handled in this system and provides traceability of the finished goods. Various reports based on the stock availability such as daily, monthly, stock adjustment details etc can be generated in this system.

The raw materials such as latex and lump are arrived to the factory for processing. The latex arrived from the field, in latex tanks are coagulated, crushed into small particles and dried to make crumb rubber. The dried rubber is pressed in the hydraulic presser to make bales and packed in pallets. Samples are collected from every 4 bales in a pallet, and are analyzed to measure specific quality parameters. The bales packed in pallets are moved from factory to the warehouse. The stocks of rubber as well as dirty rubber are maintained separately in the warehouse. Based on the dispatch instructions from the head office, factories dispatch the goods to customer place directly or to the warehouses at bulking stations.

The details of the machinery, fuel and lubricants required for the rubber processing can be captured in this system. Also the details of electricity consumption from the government grid lines as well as generators will be captured separately in this system. You can generate all the desired reports required for the monitoring and controlling of this system.



Main Features of Rubber Processing System

The Rubber Processing System facilitates the functioning of crumb rubber factory of the company. The raw materials such as latex and lump arrived to the factory are undergoing various processes to make crumb rubber.

The major features of this system are listed below:

1. The various processes from the arrival of raw materials to the manufacturing of crumb rubber are handled in this system.
2. This system records the details of raw materials arrived to the factory for processing.
 - The raw materials processed at the rubber processing units will produce the different types of semi-finished and finished goods.
3. The details of the latex arrived from own estate or out grower's estate are maintained in this system.
 - The volume of latex in the tank is measured by the dip measurement height and corresponding volume in liters is derived from the calibration tables for each tank.
4. **DRC Content:** The dried rubber content of the latex arrived is recorded in this system.
 - The dried rubber content of the latex arrived is measured using the DRC meter (Lactometer). The rubber content availability in latex is calculated as Litres * DRC %.
5. This system keeps track of the lower grade rubber such as lump and scrap arrived from the estates.
6. **Coagulation of Latex:** The details of the coagulation of latex done at the processing station are included in the system.
 - The latex arrived in the latex tanks are kept one day for coagulation. The latex from the carrying tanks is first poured into bulking tanks, and then made to flow into the coagulating pits. At both the stages chemicals such as HNS and formic acid are mixed with the latex.



7. **Crushing and dehydrating of lower grade rubber:** The details of crushing and dehydration of lower grade rubber is included in the system.
 - The lump and scrap collected from the field is washed, soaked and dehydrated for about five days before further processing. The soaked lower grade rubber is spread on a drying floor marked with different sections and rows.
8. **Drying:** This system includes the details of rubber granules dried in the driers.
 - The coagulated latex is crushed into small particles called granules. The rubber granules are stored in drying boxes and dried in driers.
9. **Reprocessing of Dried Rubber:** The process of subsequent drying of partially dried rubber is included in the system.
 - Reprocessing is the process of subsequent drying of partially dried rubber.
10. The details of the different types of pallets used to pack the bales are included in the system.
11. **Packing Bales:** The details of the bales packed in pallets are recorded in this system.
 - The dried rubber is pressed in the hydraulic presser to form bales. The bales are normally pressed to form pallets. The bales are weighed in weigh scales and packed in pallets. The pallets are numbered sequentially.
12. **Sample Collection:** Frequency of conducting the analysis of each product and the quantum of sample are collected at different stages and intervals during processing.
 - Samples are collected from every 4 bales in a pallet, and are analyzed to measure specific quality parameters.
13. **Transferring products from Factory to Warehouse:** The system keeps track of the transfer of products from factory to warehouse.
14. The stock of rubber as well and dirty rubber is maintained separately in this system.
15. **Dispatch of products:** The details of dispatch of products are also maintained in this system.
 - The products can be dispatched to the customer place or to the bulking stations, as per the advice from head office.



- The dispatch note is prepared and attached along with every dispatch.
- The bulking station sends confirmation reports on product shipments done to respective factories.

16. **Machinery Usage:** This system captures the usage of lubricants and fuel used for the operation of each machinery.

- The number of operating hours of the machinery and the details of the chemicals added to the products are captured in this system.

17. **Electricity Consumption:** The details of the electricity consumption at the processing units are captured in this system.

- The details of electricity consumed from the government grid lines as well as generators are recorded separately in this system.

18. **Report Generation:** Various reports incorporated in the system such as Daily Production Report, Stock Verification, Dispatch Report, Stock Report, Machinery Usage Report, Electricity Consumption Report etc.



Palm Kernel Oil Factory System

The PKOF (Palm Kernel Oil Factory) processes the PK (Palm Kernel) and produces CPKO (Crude Palm Kernel Oil) and PKEC (Palm Kernel Expeller Cake). The HARVEST *it* 2.0 Palm Kernel Oil Factory System facilitates the details of palm kernel processing at the PKOF.

The arrival details of palm kernel to the factory can be recorded. The details of delivery order issued to the load arrived, entry ticket, quality analysis of sample and weigh bridge weight and the variance in weight can be entered. The stock measurement of palm kernel and crude palm kernel oil in the factory can be done with the help of this system. The dispatch details of final products, produced in the factory can be entered for generating the dispatch note.

Daily stock measurement for every product can be recorded and the system will calculate the extraction percentages of the products. The quantity of electricity and water consumed in a month can be estimated with the help of daily consumption details entered to this system. The reconciliation of stock in the factory can be done. You can generate various reports containing the production details in the palm kernel oil factory.



Main Features of Palm Kernel Oil Factory System

The PKOF System facilitates the automation of entire activities of palm kernel oil factory.

The main features of this system are listed below:

1. This system captures all the details right from the palm kernel arrivals till the dispatches of finished products such as CPKO (Crude Palm Kernel Oil) and PKEC (Palm Kernel Expeller Cake).
2. **Palm Kernel Arrival:** This system caters the functionality of palm kernel, arrives from the palm oil mill and also from own estates.
 - ✓ The details such as quality analysis details and product weighment details can be entered.
 - ✓ Daily receipt details report can be generated based on these entries.
3. **Section:** This system has got provision for capturing various sections of production in PKOF.
 - ✓ Different sections like Iron Trap, Rolling Mill, Flaking Mill, Conditioner, Screw Press and Press Filter are used for processing the PK; there are no semi-finished products that need to be measured in between the sections.
 - ✓ The system captures all the process happening in the production of finished products from raw materials.
4. **Storage and Measurement:** The storage and measurement details of palm kernel and finished products in the factory can be recorded.
 - ✓ Arrivals and dispatches are not allowed during tank measurement.
 - ✓ Based on various entries the system calculates the total weight of palm kernel in silo, weight of crude palm kernel oil in tanks and total quantity of palm kernel expeller cake.
5. **Daily Production:** Daily production quantity of each product is derived from the difference between the stocks of current working day and previous working day.



6. **Quality Analysis:** The details of quality analysis tests performed at various levels of production can be entered through this system. This system can generate reports based on the variety of quality tests done.
7. **Extraction Ratio:** This system derives separate extraction ratio for finished products such as CPKO and PKEC, from the daily production details of PKOF.
8. **Dispatch Details:** You can enter the dispatch details of CPKO and PKEC based on the contract with party. The partial supply based on the production is also possible.
 - ✓ In case of CPKO, it may be transferred to the FRF for the production of RBDPKO and Lauric Fatty Acid.
 - ✓ For dispatches to third party, information of contract, signed at head office is sent to the PKOF and also to the transporter in the form of a delivery order.
 - ✓ The loading instruction details, quality analysis, weighment details and security seal and lock details of the dispatching product can be entered.
9. The PKOF system is totally integrated with the weighbridge system to get all the weighing done during various processes in the factory.
10. This system keeps tracks of all supplies to different parties as well as different estates and bulking stations (warehouse).
11. The dispatch quality analysis can be done based on the delivery order and contract with third parties.
12. **Electricity & Water Consumption:** The details of electricity and water usage can be recorded through this system. The charges to be paid for electricity and water consumption can be calculated. Apportioning of the same can be done based on the usage.
13. **Stock Reconciliation:** This system has provision for doing the stock reconciliation based on the dispatches and actual stock received at various destinations. Total differences in quantity can be adjusted at the end of the month to the current month's production of the product and in the production losses of the PKOF.
14. **Machinery Maintenance:** The system maintains section logs to analyze the efficiency of the machines used in the palm kernel oil factory. The details of maintenance done for the machines and also their spare parts requirements can be recorded.



15. **Stock Transfer:** It is possible to record the transfer of stock from one tank to another. In PKOF, transfer of stock from daily tanks to CPKO storage tanks is routine process.
- ✓ Stock measurements of the storage tanks which are taken before and after transfer can be entered through this system.
 - ✓ **Transferred Quantity and Transit Loss:** With the help of this entry the system calculates the amount of transferred stock and also the transit loss.
16. **Report Generation:** Various sets of reports can be generated through this system, to analyze different stages of production. The reports help you to know more about productivity, factory extraction rate etc.



FFB Processing System

The HARVEST *Plus* FFB Processing System automates the process carried out at different sub sections of sections and stations. This system will capture various transactions happening at the processing unit starting from the arrival of FFB (Fresh Fruit Bunch) to the dispatch of CPO (Crude Palm Oil) and PK (Palm Kernel) to various destinations. Stock and movement of FFB, CPO and PK is maintained in this system. It captures the details of the quality analysis conducted at the mill laboratory. The machineries, generators and electricity used will also be maintained in this FFB Processing System. The stock reconciliation can be done under the process of this system. All the basic settings needed for the smooth functioning of this system and the opening quantities of the product stock and equipment can be maintained. FFB Processing System produces all the desired reports required for the monitoring and controlling of this system.

The raw materials such as fresh fruit bunches are arrived to the mill for processing. The FFB arrived from the different suppliers or own estate is processed to make CPO and PK. Samples are collected and lab tests are conducted in the process sub stations. The stock is transferred from source to destination tanks. Based on the delivery orders from the customer, mill dispatch the products to customer place directly or to the warehouses at bulking stations.

The details of the machinery, fuel and lubricants required for the FFB processing can be captured in this system. Also the details of electricity consumption from the electric meters as well as generators will be captured separately in this system. You can generate all the desired reports required for the monitoring and controlling of this system.



Main Features of Fresh Fruit Bunch System

The FFB Processing System facilitates the automation of entire activities of Palm Oil Mill. This system captures all the details right from the fresh fruit bunches arrival till the crude palm oil dispatch.

The major features of this system are listed below:

1. The FFB system caters the functionality of the fresh fruit bunches arrived from different suppliers as well as from the own estates.
2. This system has got provision for capturing various stages of production in the palm oil mill. It captures all the process happening in the production of finished products from raw materials.
3. The details of the samples of materials collected to conduct the lab tests can be captured in this system.
4. The quality analysis tests at various levels of production can be done through this system. This system can generate reports based on the variety of quality tests done.
5. The details of the measurement of CPO and Kernel can be captured in this system.
6. Through this system, you can enter the quantity of the stock transferred from source to destination.
7. Separate extraction ratio for own FFB and third party extraction ratio can be derived from daily production details of POM (Palm Oil Mill).
8. There is a provision for dispatch of CPO based on the contract with party in this system. Partial supply based on the production is also possible.
9. FFB is totally integrated with the weighbridge system to get all the weighing done for POM like FFB arrival and CPO/PK dispatch.
10. This system keeps track of all supplies to different parties as well as different estates and bulking station (warehouse).



11. The details of dispatch of products are also maintained in this system.
 - The products can be dispatched to the customer place or to the bulking stations, as per the delivery order received.
 - The dispatch note is prepared and attached along with every dispatch.
12. The details of the electricity consumption at the processing units are captured in this system.
 - The details of electricity consumed from the electric meters as well as generators are recorded separately in this system.
13. The details regarding the operations of the turbines can be captured in this system.
14. This system has provision for doing the stock reconciliation based on the dispatches and actual received at various destinations.
15. This system maintains machinery running log to analyze the efficiency of the machines used in FFB processing.
16. This system takes care of the various actives in the mill like 'Tank measurement', 'Stock Transfer'(From one tank to other), Dispatching using pipeline.
17. Various sets of reports to analyze different stages of production to know more about mill productivity, Factory extraction rate etc.



Fractionation and Refining Factory System

The FRF (Fractionation and Refining Factory) processes CPO (Crude Palm Oil) and produces RBD Olein (Refined Bleached and Deodorized), RBD Stearin and Fatty Acid as the main finished products. In some cases, as per the customer demand, we are processing CPKO (Crude Palm Kernel Oil) and produces RBDPKO (Refined Bleached and Deodorized Palm Kernel Oil) and Lauric Fatty Acid as the finished products. The HARVEST *it* 2.0 Fractionation and Refining Factory System facilitates the automation of the entire activities related to refinery.

This system maintains the details related to the refining process right from the CPO arrival to the factory. The system prepares an entry ticket when a new consignment arrives and also creates a weighbridge ticket. The quality tests are done immediately after the receipt of the raw material. You can record the stock details of CPO in the storage tanks. The production lines and the machinery sections in the factory which perform specific jobs in the process cycle can be defined. The sections include pre treatment, refining, fractionation, press filter etc. The details of fatty acid stored in the tanks can be entered on a daily basis. The details of quality control tests performed on the products can be entered.

The extraction ratios of the products can be calculated using this system. The details of dispatching products from the factory, machinery maintenance, water consumption and power consumption can be recorded. The system also enables you to view the reports containing details related to various processes in the factory.



Main Features of Fractionation and Refining Factory System

The FRF (Fractionation and Refining Factory) System facilitates the automation of entire activities of refinery. In FRF, processing of CPO (Crude Palm Oil) is done. But in some cases, CPKO is also processed.

The main features of this system are listed below:

1. This system captures all the details right from the CPO/CPKO arrivals till the finished product dispatches of RBD Olein, RBD Stearin, Fatty Acid, RBDPKO etc.
2. This system caters the functionality of CPO/CPKO arrival from different suppliers and from the own estates. The details such as entry ticket issued, weighbridge weight and CPO analyzing details can be recorded.
3. The measurement details of the arrived oil in the storage tanks can be entered which includes the temperature and height of oil in the tank.
4. A production line refers to one set of machineries that processes CPO. The production lines in the factory can be defined.
5. This system has got provision for capturing various sections of production in refinery. It captures all the process happening in the production of finished products from raw materials.

You can enter the details of sections like pre treatment, refinery, fractionation etc.

Separate processing reports are prepared for each production line.

Storage and measurement details of various products can be entered.

6. The quality analysis tests at various levels of production can be done through this system. This system can generate reports based on the different quality tests done.
7. The extraction ratio for products such as RBD Olein, RBD Stearin, Fatty Acid, RBDPKO and Lauric Fatty Acid can be derived from daily production details of FRF. There are separate daily production details for CPO and CPKO.



8. There is provision for entering details of dispatch of RBD Olein, RBD Stearin, Fatty Acid, RBDPKO and Lauric Fatty Acid based on the contract with party. Partial supply is also possible based on the production.
9. This system is totally integrated with the weighbridge system to get all the weighing done such as CPO/CPKO arrival from other estates and RBD Olein, RBD Stearin, Fatty Acid, RBDPKO and Lauric Fatty Acid dispatches.
10. This system keeps track of all supplies to different parties as well as different estates and bulking stations (warehouse).
11. The quality analyzing details of dispatched products can be recorded based on the delivery order and contract with third parties.
12. You can enter the details of electricity and water consumed in the factory. The system will calculate the charges of the consumption and it will apportion the same based on the usage.
13. This system has provision for doing the stock reconciliation based on the dispatches and actual received at various destinations.
14. This system maintains section logs to analyze the efficiency of the machines used in the factory.
15. This system takes care of the various activities in the refinery like tank measurement.
16. In all the cases, the daily production is calculated for all the days even though there is no production at all. During the daily production calculation, we will get the Production details and the extraction rates, production losses and the loss percentage details etc. There are separate daily production UIs in FRF for CPO and CPKO.
17. FRF is also related with INV module and we can define a sub store of INV in FRF Settings. We can define the additives and process chemicals consumed in each process section for the processing and the total consumption of additives and process chemicals will be the issued quantity of these from the sub store tagged for INV.
18. Arrival Quality Analysis and Dispatch Quality Analysis are mandatory before doing the daily production calculation.



19. **Report Generation:** Various sets of reports can be generated to analyze different stages of production which enable you to know more about refinery productivity, factory extraction rate etc.



Tank Farm Management System

Tanks are normally used to store the various oil palm products. The HARVEST *Plus* Tank Farm Management System deals mainly with stock of products in a tank. The details can be kept estate wise using this system. The local sale and export details of products can be maintained through this system.

You can define storage tanks used in the estates through this system. Daily measurement details of tanks can be entered. This system identifies and suggests ideal storage tanks. You can enter estate wise details of each product through this system. This system can maintain the oil movement details through trucks, ships and pipelines. The details of export formalities of products can be maintained. The lab results of products in the tank can be recorded.

This system tracks the delivery order details of local sale and also shipping. It interacts mainly with HARVEST *Plus* Weighbridge System if the dispatch is done by truck and integrates with Sales System while shipping the products.



Main Features of Tank Farm Management System

This system facilitates the shipping and local sale of the products from the ware houses of the company.

The major features of this system are:

1. This system facilitates the warehouse system at port.
2. This system can handle rubber and oil products. It is able to keep track of the arrival and dispatch of the goods.
3. You can define storage tanks of products. The details of calibration of tanks such as table correction, volume calibration, and coefficient factor at different temperatures could be captured.
4. The coefficient factor and density of products at different temperatures can be recorded. This will be useful when calculating the weight of the product, which can be obtained by multiplying volume with the density of the product at the measured temperature.
5. This system can handle both export and local sale. Stock movement is done based on the instructions from centralized sales department.
6. You can capture the receipt details of products at the bulking station.
 - You can enter the product arrival details on the basis of weighbridge tickets created through the Weighbridge System.
 - If the products are arrived to the bulking station by ship, then the dispatch note details can be entered.
 - An acknowledgement can be created after receiving the products at the bulking station.
7. This system is able to track the stock of product separately for each delivery note.
8. The daily tank measurement details can be recorded and maintained in this system.
9. You can enter the delivery order details received at the bulking station for local sale of products. This can be prepared against a contract.



10. This system is capable of handling the oil movement through truck, ship and pipe line. It also integrates with weighbridge system for tracking truck movements.
11. At time of oil dispatching by ship we can keep track of the tanks on which the oil is filled and system generates the documents related to the export formalities in the prescribed format.
12. **Storage Units:** Volume of the product is calculated from the height of product in the tank using the calibration charts; For attaining the quantity of the product we are considering the temperature and specific gravity of the product at measuring temperature and the volume.
13. It is possible to keep the maintenance history of the tanks through this system.
14. **Rubber:** stock movement we are tracking Grade wise, Pallet Type Wise. And keeping pallet wise information with production & Export pallet numbers. And generates the documents relating to export formalities.



Seed Production System

The HARVEST Plus Seed Production System automates the processes involved in the production of oil palm seeds. Apart from the commercial seed production, this system also automates the research and development processes associated with the organization. Systematic research processes helps in generating new seed families with high quality.

The seed production process can be classified into seven phases. The first phase involves finding, bagging and harvesting the male flowers. In the second phase the pollens are collected from the male flowers and stored in refrigerators. Then the pollens are prepared for pollination. The third phase starts with finding female flowers and bagging them. Then crossing is done by artificial pollination of male pollen on female flowers. The due bunches are harvested and transported to bunch processing laboratory. In the fourth phase the harvested bunches undergo a series of processes in the bunch processing laboratory. After these the seeds are collected from bunches and sorted. Then embryo test is done on the sorted seeds. In the fifth phase the seeds that pass the embryo test are kept in seed store and these seeds undergo various pre-germination processes in this store. Then comes the sixth phase in which the seeds get germinated and the germinated seeds are collected. And in the last phase the germinated seeds are sorted, packed and dispatched.

In each step on each of the above said phases, thorough quality checking is done, in order to ensure, high quality of the produced seeds. If the flowers, seeds or bags used in the various stages did not pass the quality checking, then they are destroyed at that time itself. This system provides the users with a list of reports and checklists that helps in optimizing the day-to-day activities.



Features of Seed Production System

The Seed Production system computerizes all the processes that are related to the production of seeds in the company. The main processes in seed production are Pollen Collection, Pollination, Harvesting, Production Planning For Seeds, Germination, and Packing and Dispatching. The features of this system are classified according to the processes. The main features of this system are:

Pollen Collection

- Male Flower Details

You can keep track of the details of the Pisifera palms and the availability of male flowers yet to blossom in the palm through this system.

- Bagging Bag Administration

Bagging is the process of covering the flowers with bags in order to protect them from getting contaminated from wild pollens. Details of bagged male flowers can be obtained from this system. The quality of the bags, used for the bagging process can be specified through this system. Also the details of the bags issued and received can be maintained through this system.

- Quality Checking

The quality of the bagging done on the male flowers and the details of the flowers destroyed due to poor quality can be identified through this system.

- Harvesting Details

This system facilitates notifying the workers with the list of male flowers that are to be harvested.

- Pollen Extraction Details

The details of the harvested male flowers, pollens collected and sieved pollens can be maintained through this system.



- Viability Checking

This system provides the facility to calculate the viability percentage of the pollen and the moisture content percentage of the pollen collected. These calculations are done on a sample of pollens. The details of the pollens rejected after the viability process is also captured.

- The viability percentage is calculated using the formula:

(Total number of live pollen in the sample/ Total number of pollen in the sample)
* 100.

- The Moisture content percentage is calculated using the formula:

(Weight of moisture content in pollen sample / Weight of pollen sample) * 100

- Bottling of Pollen (**Barcode** for Bottle Numbers)

The pollens that are accepted after the viability test are kept in a bottle and barcodes are given to these bottles. The details of the barcodes assigned to the bottles can be maintained through this system.

- Details of Imported Pollen from other countries

Sometimes the bottles needed for storing the pollens are imported from other places. In such cases the same details can also be updated in the corresponding records.

- Pollen Stock Maintenance

The stock of pollen available each day can be obtained from this system. Also the details of the pollen that come into and go out of the stock are updated on a daily basis.

- Details of Flower Destruction

This system keeps track of the flowers that are destroyed after each stage of pollen collection.

Pollination

- Female Flower Details



This system facilitates keeping the details of the female flowers that are needed for artificial pollination and seed production.

- Female Flower Bag Administration

Bagging the female flowers is done to avoid natural pollination. Bagged female flower details can be obtained from this system. The quality of the bags, used for the bagging process can be specified through this system. Also the details of the bags issued and received can be maintained through this system.

- Quality Checking

The quality of the bagging done on the female flowers and the details of the flowers destroyed due to poor quality can be identified through this system.

- Matching Process

Matching refers to finding the best suited pollen for a female flower according to the crossing plan. This system provides a list that lists, in detail the female flower and male pollen matching results.

- Pollination Order based on the matching details

This system generates the order for pollination, using the data generated from matching process.

- Pollination Details (implementation of *Barcode* for Pollination No)

This system generates a label based on the pollination order and these labels are fixed on the female flowers, to identify the pollination done on them.

- Quality Checking On Pollination

This system provides the list of palms to be inspected daily for quality checking, based on the pollination order data.

Bunch Harvesting

- Harvesting Details of Bunches

This system generates the list of palms to be harvested and issues the order for harvesting.

- Bunch Processing Details(Chopping, Stripping, Depulping, Sorting)



In the bunch Processing Laboratory, the harvested bunches must undergo certain processes such as, chopping, stripping, depulping and sorting, before seed preparation. The daily activity recording at the Bunch Processing Laboratory as well as the details of the incentives for various workers at various stages in the Bunch Processing Laboratory can be maintained in this system.

- **Seed Stock Maintenance**

The stock of seed available in the store can be obtained from this system. The details of the seeds that come into and go out of the stock are updated on a daily basis. The detailed list of seeds in the store, seeds in the store dark room, seeds in the store heat room, etc. can be viewed in this system. Also this system provides the details of the stock of expired and ready to sale seeds.

Production Planning For Seeds

- **Production Order**

This system prepares the production plan for the organization, specifying the quantity of seed to be produced in a year. This includes the quantity of seed to be produced in each working day in the year. Apart from this, another plan is prepared for every month, which contains the category wise estimation of seed production. According to this plan, the system prepares production order.

Germination

- **Details of various germination processes (Soaking, Fungicide application, Aeration, Heating, Sampling etc.)**

This system maintains the details of each process involved in germination. The main processes in germination of seeds are soaking, fungicide application, aeration, heating and sampling. The details of each of these processes done on the seeds can be tracked through this system.

Packing and Dispatching

- **Collection and Selection Process of Seeds**
- **Packing Details (Implementation of *Barcode* for Bag Numbers)**



- Details of Dispatching

This system maintains the details of the seeds dispatched to the customers according to their requirements. Along this, the acknowledgement card for goods receipt from the customers is also prepared.

- Destruction of Expired Seeds

Main Reports

Various reports are included in this system to enhance its working. Also reports are incorporated according to the end user requirements. Some of the main reports in this system are:

- Bagging failure report
- Bunch processing report
- Bunch Production Activity Report
- Bunch production summary report
- Category wise seed prod status
- Daily Summary Quality Analysis
- Germination ageing report
- Pollen Stock Reports
- Pollen distribution report
- Pollen Production
- Pollination failure report
- Pollen Harvest summary
- Production report
- Seed Stock Report
- Seed Status



- Seed Status Germination
- Seed Status losses
- Quality Checking Reports
- Male & Female Flower Finding Report
- Male & Female Flower Bagging Report
- Bunch Harvesting Report