CHAPTER 5

DATA MENU

The **Data** option provides access to the data of a certain farmer, farming operation or analyses. It is therefore necessary to first open a database (*File* | *Open database*) in order to get access to the Data menu. Once all the data is entered, little effort will be needed in subsequent years or analysis to manage the data. The main reason is that prices are handled in related groups and are not scattered through the model. Thus an analysis comprises the updating of prices and adjustment to key variables due to different management strategies.

Input data for each farm operation is arranged under the **Data** menu as Starting date setup, Economic variables, Land, Irrigation systems, Mechanisation, Operation database, Labour information and Crop as well as Livestock enterprises (see Figure 5.1). If one wants to edit some input data, one has to consider where the logic location/grouping for it will be.

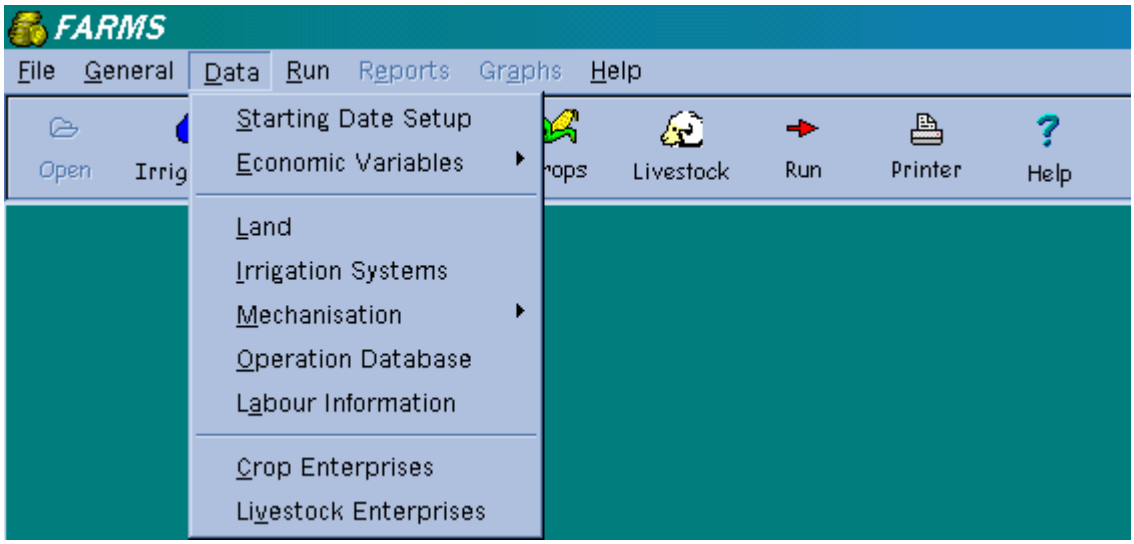

FIGURE 5.1 THE OPTIONS UNDER DATA IN THE MAIN MENU

Say for instance that you want to change the bank interest rate. Ask yourself where you will look for it. In **Data's** submenu choose Economic variables. Another submenu will appear with the following choices, e.g. Interest and inflation rates, Fixed obligations, Assets and Overhead cash flow. You can change bank interest rates under the option Interest and Inflation rates.

5.1 STARTING DATE SETUP *(Data | Starting date setup)*

Although the *FARMS* user has the option to alter the starting date of the economic analysis under the File menu (*File* | *Open database*), the first data-menu option also provides this facility.

The setup of the analysis period can be regarded as the first step in the process of data input, because most of the other farming activities and input items have to be coupled to a specific month. This enables the *FARMS* model to provide results on a monthly basis, which are mostly needed for the farmer to plan his cash and credit flow in advance. Further in the model these months will be referred to. To change the starting date, click on the arrow next to the date. A calendar will then appear. Use the arrows to scroll the months or click on the month's name for the list of all twelve months. After the year has been clicked, the analysis year can be scrolled by clicking on the up or down arrow next to the year. To change the day, simply left click on the day you want with the mouse, after which the calendar will disappear and the new date will be entered.

This analysis stretches over a period of 12 months, but due to the biological nature of agriculture the management process is not only bound by the 12 calendar months, but include decisions that stretch over two successive seasons. As activities of different enterprises cannot be restricted to the same 12 months, provision is made for activities that take place in the 12 months directly preceding the year of analysis.

WARNING: If the starting month is changed at a later stage, all the months that were entered earlier will change. However if only the year changes, all the months will remain the same throughout the model.

5.2 ECONOMIC VARIABLES

In *FARMS* we deviate from a cash flow statement only, because in practice, especially in the case of crops, the credit facilities of cooperatives are used. Farmers can therefore purchase farm necessities through cash payments (cash flow) or through the cooperative on credit (credit flow). Money flow can therefore either be **Cash** or on **Credit.**

Double-click in the cell where flow has to be entered. Subsequently click on the down arrow and either on cash or credit.

The cooperative's credit differs in two aspects from other creditors. Firstly, the production-loan is not paid at the end of the transaction month, but at the end of the season when income is realised, hence interest accumulates monthly. Secondly, these accounts are usually paid by the delivery of a harvest to the cooperative and not by means of a cheque. The surplus is paid to the producer as a cheque which is then paid into the bank account (cash flow).

5.2.1 INTEREST AND INFLATION RATES *(Data | Economic variables | Interest and inflation rates)*

DATE OF RATES

Firstly the date should be adjusted. Click on the arrow to change the date. See Section 5.1 on how to change the date.

POSITIVE BANK BALANCE

The interest rate that the farmer will receive on a positive bank balance.

BANK OVERDRAFT

The interest rate that the farmer will pay in case of a negative bank balance.

PRODUCTION LOAN

The interest rate that the farmer will pay to the cooperative on the amount he owes them.

SAVINGS ACCOUNT

The interest rate that the farmer would be able to get on his savings account. This rate must be higher than the annual inflation rate for capital goods.

GENERAL

The annual general inflation rate of the country.

CAPITAL GOODS

The annual inflation rate on capital goods.

PRODUCTION INPUTS

The annual inflation rate on production inputs.

REAL INTEREST RATE

The annual real interest rate is a function of the annual nominal interest rate (savings account rate) and the annual capital goods inflation rate, *and is approximately equal to the nominal*

interest rate minus the inflation rate. It is important to note that the calculations of interest on asset values entered are done on the annual real interest rate.

Real interest rate = (1 + annual nominal interest rate) / (1 + annual capital goods inflation rate) – 1

5.2.2 FIXED OBLIGATIONS *(Data | Economic variables | Fixed obligations)*

Management decisions regarding investments can only be evaluated by means of financial feasibility studies at whole farm level. This implies that the additional risk due to interest on medium- and long-term loans needs to be estimated.

Although investments are long term in nature, the short-term implications thereof, such as its influence on monthly cash flow, can be analysed.

Details regarding balances and limits of short-term obligations are specified on page one. On the second and third page the specification of interest rates, balances and payment amounts on intermediate and long-term loans must be entered in order to be able to calculate cost on the basis thereof. Provision is also made for new hire purchases and loans negotiated during the period under analysis.

5.2.2.1 BALANCES AND LIMITS *(Data | Economic variables | Fixed obligations | Balances and limits)*

BALANCES

The starting and ending date of the analysis period are shown for the balances.

The debt of the firm is one of the most significant financial factors that influence the implementation of alternative crop rotations. The starting balances have an influence on the interest costs at enterprise level.

BANK

This is the bank balance at the beginning of the analysis period.

PRODUCTION LOAN

The balance of the production loan at the beginning of the period of analysis. In most cases, but not necessarily, the production loan can be implemented as the cooperative account.

CREDITORS

Both the starting and ending balances of the creditors.

LIMITS

The overdraft and production loan limits are included in *FARMS* for debt control. When these limits are exceeded, the calculations will be done normally, but the user will receive a warning.

OVERDRAFT

At this level the program will warn the user if his overdraft limit is exceeded for any month.

PRODUCTION LOAN

This is to warn the user if he is exceeding the production loan limit.

5.2.2.2 INTERMEDIATE AND LONG-TERM *(Data | Economic variable | Fixed obligations | Intermediate or long term)*

The capital component of the payment is computed as the residual after interest is deducted. Provision is made for details of a new hire purchase at intermediate or a new loan at long-term obligations during the year of analysis. Either by entering the data using the navigation bar above the table, or by clicking on *hire purchase* on the intermediate term page or on *new loan* on the long-term page.

The capital borrowed through a new loan can be used for financing assets or for re-scheduling (consolidation) debts. In the latter case the month during which money is paid into the bank account must be indicated. Consequently financing alternatives can be evaluated at whole farm level.

DESCRIPTION

Description of the liability; usually refers to an institution.

PERIOD OF PAYMENT

Indicates the payment period (yearly or monthly).

BALANCE

The total outstanding loan amount or the capital needed.

MONTH

The month during which the payment has to be made, in the case of yearly payments.

INTEREST RATE (%)

The rate at which interest on the loan is being calculated.

PAYMENT

Payment refers to the total amount payable annually or monthly on the loan; thus the total of capital and interest payment.

TOTAL INTEREST

The interest amount calculated by the *FARMS* program.

TOTAL CAPITAL

The capital calculated is the difference between the payment and the interest amount.

END BALANCE

Balances for the ensuring period are calculated.

If the **Hire purchase** or **New loan** button is clicked, a window will appear on which the user must indicate for what purpose he needs the money and then click the OK button. The next screen shown depends on the item chosen. All the required information on the specific item must then be entered and then OK must be clicked. The description and the balance are automatically inserted and can be edited. The rest of the information must then be entered before the user can move on. The program will automatically calculate the green fields, namely interest and capital.

The following information are automatically inserted in the description and balance columns:

DESCRIPTION	**BALANCE**
Mechanisation system	Purchase price
Irrigation system	Purchase price
Crop equipment	Increase in current value
Livestock equipment	Increase in current value
Land	Area (ha) x Initial value/ha
Breeding stock	Initial quantity x Initial market value/head

5.2.3 ASSETS *(Data | Economic variables | Assets)*

Assets are dealt with in three categories, namely Buildings, Equipment and Current assets.

5.2.3.1 BUILDINGS AND EQUIPMENT

The value of both buildings and equipment directly associated with crop and livestock enterprises on the farm, as well as the annual estimated repairs and maintenance, as well as insurance rates must be specified on the first and second page.

DESCRIPTION

Describes whether crop or livestock enterprises are applicable. The user cannot change these descriptions.

CURRENT VALUE

The current market value of buildings and equipment associated with the crop and livestock enterprises.

MONTH

The month during which the payment is to be made.

TYPE OF FLOW

Indicate the type of money flow (cash or credit).

RATE/YEAR (%)

Annual repairs and maintenance as well as insurance as a percentage of the current value.

REPAIRS AND MAINTENANCE

This amount is calculated automatically (since it is highlighted in green).

INSURANCE

This amount is also calculated automatically.

5.2.3.2 CURRENT ASSETS

Asset values are needed here for balance sheet purposes. Differences between start and end values have implications for farm profit.

PRODUCTION INPUTS

The start and end value of production stocks.

CROPS/GRAIN

The start and end value of these farm-produced products.

MARKETABLE LIVESTOCK

Both the start and end value of these farm-produced products.

INVESTMENTS

The start and end value of investment balances.

DEBTORS

Both the start and end amount of money owed to you by other people or institutions.

5.2.4 OVERHEAD CASH FLOW *(Data | Economic variable | Overhead cash flow)*

Cash flow that cannot be accommodated at enterprise level is dealt with here. Monthly diverse inflows are entered on the first page and diverse outflows on the second page.

5.2.4.1 DIVERSE INFLOW

Diverse cash inflows affect the banking account positively.

RENT RECEIVED

Rent received for either land, fixed improvements, and so forth.

OTHER INCOME

Expected income that was not taken into account anywhere else.

NON-FARMING INCOME

Income generated from non-farming activities.

CONSOLIDATION

The financing of existing debt.

5.2.4.2 DIVERSE OUTFLOW

Diverse cash outflows affect the banking account negatively.

RENT PAID

Rent paid in addition to that for leased land is entered here.

OTHER EXPENSES

Other farm outflow that has not been entered elsewhere in the program can be entered here.

LIVING EXPENSES

An indication of the monthly amount of money that is needed by the owner for private and household expenses.

INCOME TAX

The estimated income tax that the farmer would have to pay during the period of analysis.

5.3 LAND *(Data | Land)*

Farming operations can be conducted on own as well as leased land, hence land is divided into these two groups. The level of detail is determined by the unique situation of every farmer. For example, a field can be irrigated by means of more than one irrigation system and planted to more than one crop. Therefore land must be divided into enough fields to accommodate all crops and irrigation systems.

5.3.1 OWN LAND

Distinctions can also be made between fields of different farms.

FIELD ID

This is a unique number, name or a combination of this to identify each field or camp utilised for crop and livestock production. If not unique an error message will appear on the screen. In general this ID will correspond to the number that the farmer usually uses for each field.

DESCRIPTION

A short description of the field ID identifies it.

LAND TYPE

Classify fields according to usage, namely dry land, irrigated, grazing, pastures, orchard and odd pieces. Double-click in the cell. Subsequently click on the down arrow and desired type of land to make a selection.

AREA (ha)

Dry land and irrigation areas under crops cannot exceed the corresponding area in this section.

INITIAL VALUE/HA AND FINAL VALUE/HA

These values are used to calculate the total value of land in the balance sheet.

5.3.2 LEASED LAND

Similarly to own land, a field ID, description, land type and area are required (see the previous section). The following four columns are peculiar to leased land.

RENT/HA/YEAR

An annual amount per hectare payable for the specific field leased.

MONTH 1 AND 2

Select months in both columns if rent is paid in two equal instalments and only a month in the first column if rent is paid annually. A month is selected by double-clicking the cell and clicking the down arrow and the desired month.

AMOUNT/YEAR

This amount is calculated automatically since the column is highlighted in green.

5.4 IRRIGATION SYSTEMS *(Data | Irrigation systems)*

Enter the date if list prices are updated. Click on the down arrow next to the date (see Section 5.1)

An irrigation system can be imported from IRRICOST. A water-drop button appears on the navigation bar if the white square in front of "Use IRRICOST" under options in the file menu is clicked. In the latter case a tick appears in the square. Click the water-drop and subsequently double-click the irrigation system to be imported.

FORM OR GRID

Details of the irrigation system are more easily entered on a form, while annual updates are more easily performed on the grid. The latter gives a more complete picture.

SYSTEM ID

A unique number or name has to be given to every irrigation system. If systems are imported from IRRICOST this name corresponds to the one in IRRICOST. If the IRRICOST module is

installed on your computer, you can select an irrigation system from the list by double-clicking in the System ID cell. All the relevant information of the chosen irrigation system will then be inserted into your table and the chosen system can be edited. The user can also insert or edit a system simply by clicking on the insert or edit button.

IRRIGATION TYPE

Double-click in the cell and then click once on the down arrow. Select either hand line, flood, micro, drip or centre pivot by clicking on the desired name.

AREA (ha)

This is the area that a system can irrigate.

PUMPING RATE (cub.m/h)

The pumping rate of the irrigation system in cubic meter per hour.

MODEL YEAR

Indicates year of purchase.

LIFE-SPAN (yr)

This is the useful life of the irrigation system.

REPAIRS AND MAINTENANCE (%)

Repairs and maintenance are required as a percentage of the list price per 1 000 hours usage.

SALVAGE VALUE (%)

Is required as a percentage of the purchase price.

PURCHASE PRICE

The price the farmer paid for the irrigation system.

MARKET VALUE

The current value of the irrigation system.

LIST PRICE

The price of a new similar irrigation system.

MONTHLY ELECTRICITY RENTAL (R/mo)

The basic charge payable per point of delivery whether electricity is consumed or not.

VARIABLE ELECTRICITY COST (c/mm.ha)

The variable electricity cost (cent) of a one mm or 10m^3 application to one ha.

FIXED WATER COST (R/ha/yr)

The fixed water cost annually payable per hectare, regardless of the quantity of water used.

WATER COSTS PAYMENT MONTH

The annual payment date for water costs.

VARIABLE WATER COST (c/mm.ha)

The variable water cost (cent) of a one mm or 10 m^3 application to one ha.

INSURANCE RATE (%)

As a percentage of the market value of the irrigation system. This is an annual rate.

INSURANCE PREMIUM (R)

Alternatively the farmer can enter an annual rand amount.

BASIC AMOUNT EXCLUDED (R)

The deduction from the insured value allowed.

MONTH OF PAYMENT

The month during which the annual insurance payment is made.

TYPE OF FLOW

Either cash or credit.

5.5 MECHANISATION

Mechanisation parameters and the mechanisation system are dealt with under this section.

5.5.1 PARAMETERS *(Data | Mechanisation | Parameters)*

Mechanisation parameters are divided into three pages, namely fuel, lubrication, and repairs and maintenance.

5.5.1.1 FUEL

In addition to fuel prices this page also provides for the following:

INITIAL DIESEL STOCK (l)

The quantity of diesel in stock at the beginning of the analysis period.

MINIMUM DIESEL RESERVE (l)

The diesel stock level at which the farmer orders again.

QUANTITY OF DIESEL DELIVERED (l)

The quantity of diesel ordered at a time.

TYPE OF FLOW

Depending whether diesel is paid for in cash or ordered on credit.

ADDITIONAL MONTHLY USE (l)

The average additional monthly quantity of petrol as well as diesel.

CALCULATION METHOD

Fuel consumption can be calculated in two ways, namely as a constant quantity per kilowatt-hour or as a quantity dependent on the working load of the machine.

This method calculates diesel consumption more accurately. The table couple diesel consumption (l/kWh) to the workload (%) of a machine. Workload is explained in Section 5.6 (Operation database).

5.5.1.2 LUBRICATION

Oil and grease are dealt with on this page.

CALCULATION METHOD

Lubrication costs can be calculated in two ways. Firstly, a constant amount can be provided. Consequently a table has to be compiled. Click in the month column and on the arrow which will appear. Select a month by clicking on it. Allocate lubrication costs to the month by entering a percentage in the distribution column. The lubrication costs are calculated automatically. An error message appears if the percentages do not add up to 100 percent. Secondly, a percentage of fuel costs can be entered. In this instance lubrication costs are calculated as a percentage of fuel costs.

TYPE OF FLOW

Whether cash or credit flow.

5.5.1.3 REPAIRS AND MAINTENANCE

This page budgets for repairs and maintenance of machinery.

CALCULATION METHOD

Repairs and maintenance costs can be calculated in two ways. Firstly, a constant amount can be provided. This amount is distributed amongst the machines in the same ratio as calculated repairs and maintenance costs. Secondly, costs can be calculated according to use. In this instance repairs and maintenance are calculated for the actual number of hours that a specific machine was used.

TYPE OF FLOW

The type of money flow, whether cash or on credit.

Depending whether repairs and maintenance are paid cash or obtained on credit.

5.5.2 MECHANISATION SYSTEM *(Data | Mechanisation | System)*

All the tractors, implements and vehicles of the user should be entered here. A machine can also be imported from the machinery database and edited if necessary.

FORM/GRID

The user can fill in or edit the variables on both pages. However, it is recommended to use the *Form* page to enter all the details of a machine, and the *Grid* page to get a better picture of all the machines on the farm and to edit the market value and list price columns annually. The entire list of machines can be printed by clicking the Print button at the top of the window next to the navigation bar. This list can be used to update market values and list prices. The date when these values and prices were last updated appears at the top of the window.

MACHINE DESCRIPTION

A unique name to describe the specific tractor, implement or vehicle. To import a machine from the machinery database, double-click the machine description field on the form, or the cell in

case of the grid. A window will appear, with the general list of previously entered machines. The user can then either double-click on the appropriate machine, or go to the find box for a quick search on the machine. When the user double-clicks on the chosen machine, the window will disappear and the chosen machine's information will be inserted into the appropriate fields. All the values of this new machine can be edited.

MODEL YEAR

The year during which the specific machine was purchased.

LIFE-SPAN (yr)

This time period is an indication of the expected life-span of the tractor, implement or vehicle.

KW-SIZE (kW)

Enter the power size (kW) of machines with engines.

MAXIMUM LOAD (t)

The maximum load a trailer, lorry or light delivery vehicle can transport, *e.g.* a 10-ton lorry.

WIDTH (m)

The width of implements in metres.

REPAIRS AND MAINTENANCE (%)

This is one of the few input items in farms that can be classified as complex, theoretical and perhaps difficult to obtain. The reason for this is twofold. Firstly, reparation cost is usually available as an absolute annual value, not for a specific implement, but as a total cost for the entire mechanisation system. The second reason is that repair cost is not distributed evenly over time.

FARMS requires a percentage value for the calculation of repair cost for each implement. This percentage has to express average annual repair cost during 1 000 working hours as a percentage of the list price (price of a new implement). The reason for using the list price in this calculation method is to cater/attend indirectly for the influence of inflation on annual costs. Furthermore this coefficient has to be expressed in terms of 1 000 working hours to account for the variable nature of repair costs.

SALVAGE VALUE (%)

The value of each implement that can be realised after the end of its life-span estimated as a percentage of the initial purchase price.

PURCHASE PRICE (R)

The price paid for the machine.

MARKET VALUE (R)

Indicate potential price that can be obtained for the specific machine during the year of the current analysis, in other words the current value.

LIST PRICE (R)

Indicates the current price of an identical or similar machine to replace the existing one.

INSURANCE RATE (%)

The insurance cost is calculated as an annual rate (%) of the market value of the machine.

INSURANCE PREMIUM (R)

Alternatively the farmer can enter an annual rand amount.

BASIC AMOUNT EXCLUDED (R)

The deduction from the insured value allowed.

MONTH OF PAYMENT

The month during which the annual insurance payment is made.

TYPE OF FLOW

Either cash or credit.

LICENCE FEE (R\yr)

The fee to be paid each year for tractors, trailers, lorries and light delivery vehicles that travel on national roads.

5.6 OPERATION DATABASE *(Data | Operation database)*

The operation database makes it easier to enter the same operation in more than one enterprise or month.

FORM/GRID

It is recommended to use the *Form* page to enter all the details of the operation, and the *Grid* page to get a better picture of all the operations on the farm and to edit columns more easily.

OPERATION

Each operation has to be named. If an operation can be carried out with more than one machine-implement combination, all the mutually exclusive combinations should have identical operation names.

MACHINE AS WELL AS IMPLEMENT 1 AND 2

To enter or edit a machine or implement, click on the down arrow on the form page or double-click in the column on the grid. A list of machines with kW-sizes or maximum loads from the mechanisation system will appear in the case of machines and a list of implements with widths or maximum loads in the case of implements. Click on the machine on the form page or double-click on the machine on the grid page. The machine is entered together with the applicable kW-sizes, maximum loads, and widths. If two implements are used simultaneously in one operation, the second implement's width will be automatically entered if it is narrower than implement 1. Kilowatt sizes, widths and maximum loads can be edited.

COST CALCULATION BASE

Double-click in the column (only on the grid page), click on the down arrow and select the cost calculation base, namely width, hour and kilometre. The latter depends on whether an implement, a stationary implement or a tractor and trailer or lorry is used.

KW-SIZE (KW)

This value is imported and can consequently be edited.

MAXIMUM LOAD (T)

This value can also be edited.

WIDTH (M)

The width of the implement (widest implement) appears in this column and can be edited.

SPEED (KM/H)

The speed at which a cultivation or transport action is carried out.

WORK LOAD (%)

A small implement utilises a large tractor less than 100%.

FIELD EFFICIENCY (%)

Provision is hereby made for the time spend on turning on the headlands, filling seed and fertiliser bins on a planter, etc.

WORKING HOURS/FIELD HOUR

For example, 1.1 working hours per field hour implies that six minutes should be added to the total number of working hours for a specific operation for every hour that is spend on the field. Provision is hereby made for time spent in getting to the field.

LABOUR HOURS/WORKING HOURS

Two labour hours per working hour implies that two labourers are employed simultaneously on a tractor and planter.

WORK RATE (ha/h)

The model calculates the area that can be cultivated during one hour.

5.7 LABOUR INFORMATION *(Data | Labour information)*

All information associated with labour as well as available field-hours are entered here. Labour information is divided into three groups, namely permanent labour salaries, hourly remuneration and available field and man-hours.

5.7.1 PERMANENT LABOUR SALARIES

The program automatically calculates the amount per month per job level as well as salaries per month and year. Family labour is to be excluded.

JOB DESCRIPTION

Each group of labourers who receives a different salary should have a different job description.

NUMBER

The number of labourers with that specific job description.

SALARY/LABOURER/MONTH (R)

The amount a single labourer earns per month.

TOTAL SALARY/LEVEL/MONTH (R)

Is automatically calculated by multiplying the previous two columns.

5.7.2 HOURLY REMUNERATION

The average cost of permanent as well as temporary labourers is used to calculate the labour cost for the different enterprises.

AVERAGE SALARY OF PERMANENT LABOURERS (R)

The program calculates an average rate respectively for crop and livestock enterprises as a measure for the user. These amounts should be re-entered or alternative values should be provided.

WAGES OF TEMPORARY LABOURERS (R)

In the case of temporary labourers, an amount per hour must be entered for both crop and livestock enterprises

5.7.3 AVAILABLE FIELD AND MAN-HOURS

The available field and man-hours cannot be exceeded by permanent labour hours required for the mechanisation and irrigation systems. The program automatically calculates the total number of permanent labourers.

MONTH

Is automatically entered in the first field.

FIELD DAYS

Field days depend on the weather.

FIELD HOURS/DAY

Field hours per day depend on the season and the weather. For example, in winter fewer sunshine hours are available.

TOTAL FIELD HOURS/MONTH

The program multiplies the previous two columns

MAN DAYS

The number of working days in a specific month, excluding holidays, Sundays, etc.

MAN HOURS/DAY

Depends on legislation.

AVAILABLE MAN HOURS/MONTH

The previous two columns are multiplied by the total number of permanent labourers.