

Chapter 4

Forecasting

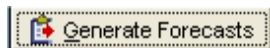
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Making forecasts

Steps

1. Firstly ensure you have the appropriate vintage and lot selected on the main screen.
2. Now click on the **Generate Forecasts** button.

A screenshot of a software window titled "Forecast for Lot: Forecasting Exercise". The window has a blue header bar with a "Select History From" dropdown menu set to "Forecasting Exercise", and "Save" and "Close" buttons. The main area contains several input fields: "Metres Row / Lot" with the value "3732 m", a downward arrow, and a "Weight / Metre Estimate From" dropdown menu. Below this are five more "Estimate From" dropdown menus: "Bunches / Metre", "Berry Loss Factor", "Bunch Gain / Loss Factor", "Weight Per Berry", and "Weight / Bunch". On the right side, there is a "Harvest Efficiency Estimate From" dropdown menu. At the bottom left, there is a section labeled "Most likely results:" with "Yield" and "Delivery" listed below it.

3. You will see that your selected Lot will be the default selection in the “Select History From” pick list.

Grape Forecaster can calculate forecasts of grape deliveries using a range of different formulae. The particular formula that Grape Forecaster eventually uses to make a forecast is built from “components” that you choose step by step.

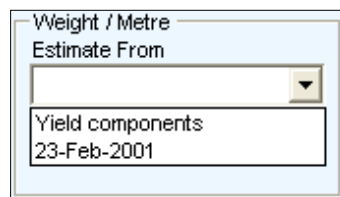
For example, this relatively simple formula consists of three components, which are multiplied to make a forecast:

$$\begin{array}{c}
 \text{Metres of row in the Lot} \\
 \times \\
 \text{Weight per metre of row} \\
 \times \\
 \text{Harvest efficiency} \\
 = \\
 \text{Weight delivered to the winery from the Lot}
 \end{array}$$

The number of metres of row in the selected Lot is displayed in the top left corner of the “Forecasts” window. Grape Forecaster calculates this for you from the Patch and Row information that you entered when you set up your Vineyards under *Configuration / Vineyards, Patches and Rows ...*

To calculate an estimate of the total weight of grapes in the Lot at the time of harvest, Grape Forecaster needs to know how you want it to calculate an estimate of mean weight per metre of row. If you have picked segments near harvest and entered “Kilograms” data either in the **Add/Edit data** window or by using Grape Sampler on a handheld computer, Grape Forecaster can calculate this directly, allowing for the segment length. Alternatively, you may need to build an estimate of weight per metre at harvest from other components. This would be the case at any stage earlier in the season.

Building a forecast from segment weight data



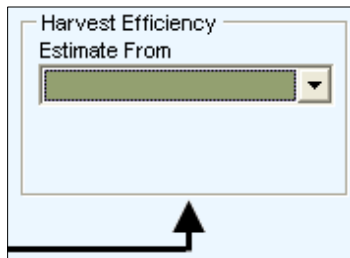
Click on the ▼ symbol at the right of the “Estimate from” box in the “Weight/metre” component area. You will see a drop down list of options for calculating weight/metre.

The option at the top of the list will be “Yield components”. Building an estimate of weight/metre from yield components is dealt with below.

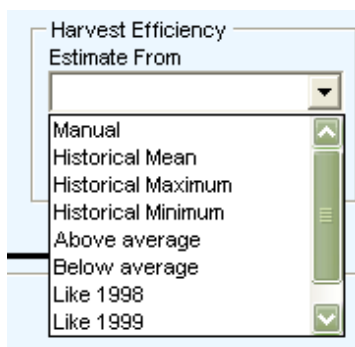
If you have picked segments near harvest and entered the “Kilograms” data, Grape Forecaster can calculate weight/metre directly, allowing for the segment length, and will present a list of sampling dates. Commonly there would only be one date, but

there could be more if “Kilograms” data from more than one sampling is available.

If you select a date the estimate of mean kg/m derived from the sampling will be displayed, together with the upper and lower limits of “Doubt”. The next component area, “Harvest Efficiency”, will also appear.



Estimating Harvest Efficiency



Click on the ▼ symbol at the right of the “Estimate from” box in the “Harvest Efficiency” component area. You will see a list of options for sources of an estimate of harvest efficiency. The composition of this list will vary according to the availability of historical data for the selected Lot.

The “Manual” option will always be at the top of the list, and may be the only option available if there is no historical data.

For each component of a forecasting formula that is a statistic derived from historical data, the following options may be available:

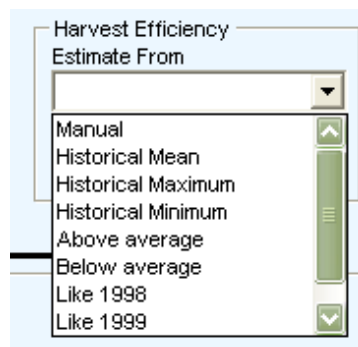
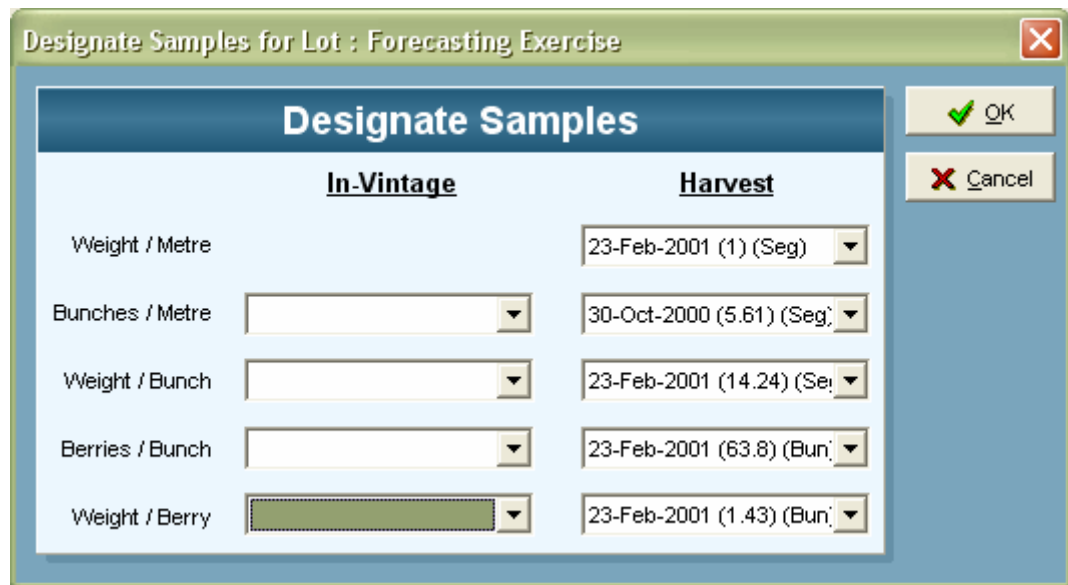
If 2 or more years of historical data are available, these statistics will be available:

- Historical mean
- Historical maximum
- Historical minimum
- Above average (mean + standard deviation)
- Below average (mean – standard deviation)

The mean, maximum, minimum and standard deviation are calculated from the sample means for all available years. To make historical data available for forecasting, you must click on the



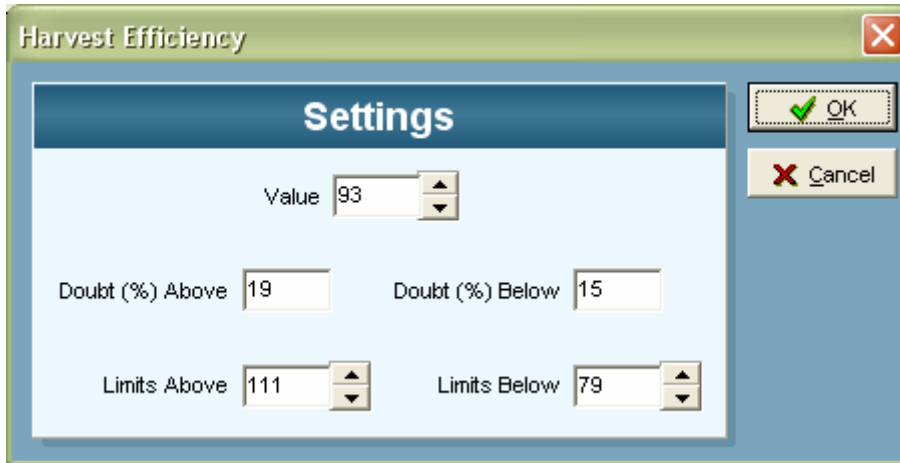
Designate History button and designate which samples are to be used for calculation of historical statistics for each Lot in each Vintage.



Below the historical statistical options there will also be the option to select the value for each year for which historical data is available. These are presented in the list in the form “Like [year]”. For example, if you selected an option called “Like 1998” Grape Forecaster would use the value for the 1998 Season to make a forecast.

Estimating Harvest Efficiency manually

If you select the “Manual” option to set Harvest Efficiency, you will see this window:



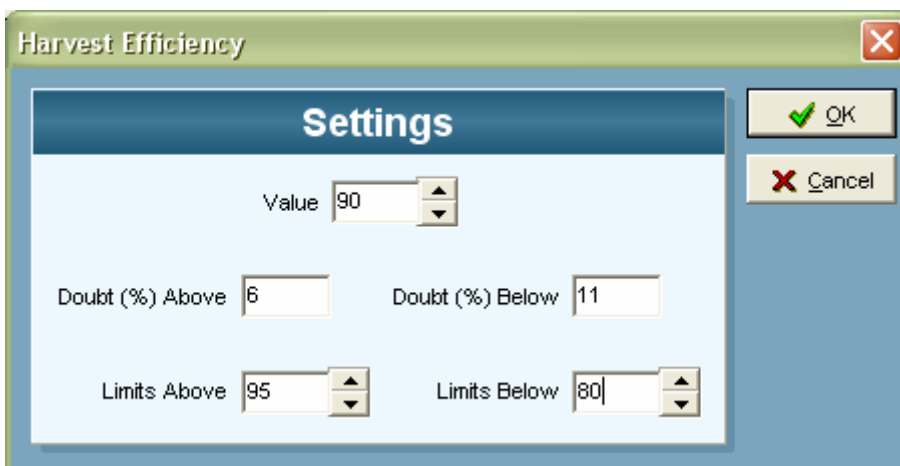
Defaults are initially displayed for the Value that is to be used and the Limits to the range of Doubt above and below the Value. All of the numbers in

boxes with “spin buttons” next to them can be set manually.

Grape Forecaster will not allow you to set an upper limit lower than the Value, or a lower limit higher than the value.

As you adjust the Value and the Limits to the range of Doubt, the Doubt % will recalculate. You can have a different Doubt % above and below the Value.

For example, you may know that a typical harvest efficiency for machine harvesting is 90%, but cannot be more than 95% because



5% is in the bunch stalks, which are left behind. On the other hand you may know that it is possible to lose up to 15% during harvesting and transporting to the winery (in

addition to leaving the stalks behind). In this case you could set the values and limits as shown in the example above.

If you click the **Cancel** button at this stage any changes will be lost, you will be returned to the “Harvest efficiency” component area and defaults will be used to forecast.

If you click the **OK** button Grape Forecaster will now have all the components it needs to calculate a forecast and it will do so.

Estimating Harvest Efficiency using a value from a previous year

If you select a “Like [year]” option to set Harvest Efficiency, you will see a window like this:

This is actually the “Manually Set Harvest Efficiency” window, and works the same way, except that you cannot change the Value because it is calculated from historical data. However, you can change the Doubt Limits as described above, and the **Cancel** and **OK** buttons work the same way as for the “Manual” option.

Estimating Harvest Efficiency using an historical maximum or minimum

If you select one of the “Historical maximum” or “Historical minimum” options to set Harvest Efficiency, you will see the “Manually Set Harvest Efficiency” window with the Value calculated from historical data. In other respects the window works the same way as for the “Manual” option.

Estimating Harvest Efficiency using historical statistics related to the mean

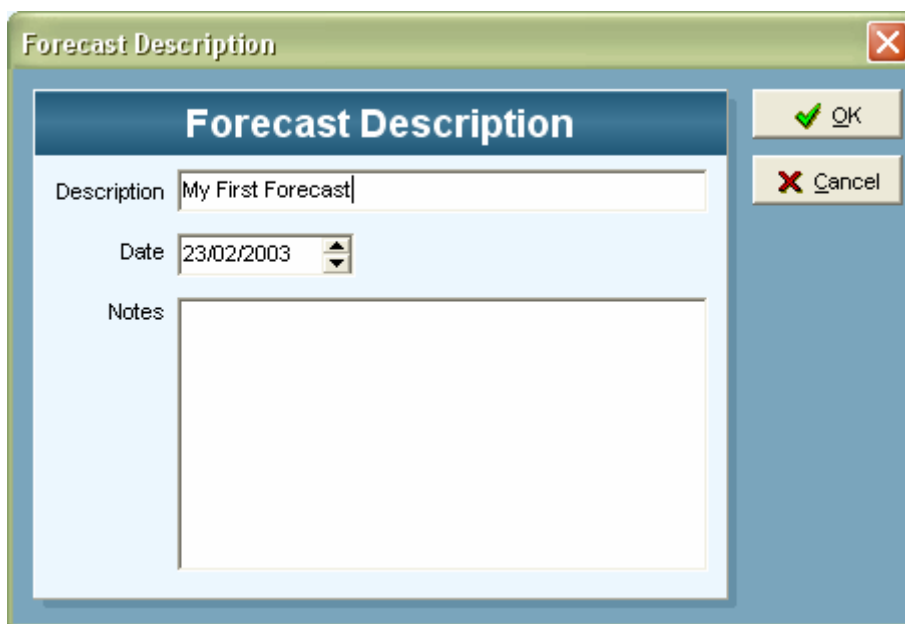
If you select one of the “Historical mean”, “Above average” or “Below average” options to set Harvest Efficiency, the Value and Limits will be calculated automatically and a forecast will be calculated.

Interpreting and saving a forecast

Harvest Efficiency is always the last component to be estimated in a forecasting formula. When a value for it has been set, Grape Forecaster will calculate a forecast and display it in the “Most likely Yield and Delivery” area at the bottom of the “Forecasts” window.

The Delivery is the weight (tonnes) that will be delivered to the winery from the Lot. The Yield is the Delivery divided by the area of the Lot, expressed as tonnes/hectare.

If you click on the **Close** button you will simply be returned to the main Grape Forecaster window. If you wish to save the forecast so that it can be included in printed reports and evaluated, click on the **Save** button. You will see this window:



The forecast will be identified at this point only by the date of the latest sampling that was used to calculate the value of a component in the forecasting formula. Type a name for the forecast in the

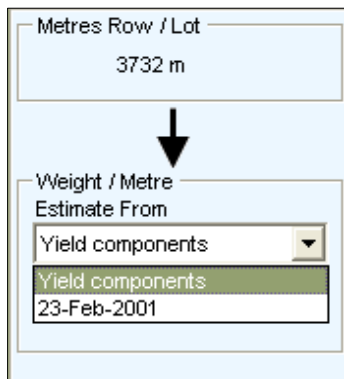
Description box. You may also type in some notes for later reference.

If you click on the **Cancel** button the Name and Notes will not be saved. You will be returned to the “Forecasts” window and the forecast you made will still be displayed.

If you click on the **OK** button the Name and Notes will be saved. You will be returned to the “Forecasts” window, which will be set up to start a new forecast.

Building a forecast from yield component data

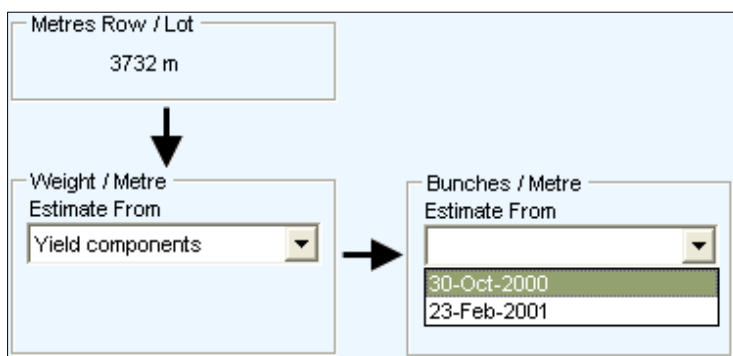
An estimate of Weight/metre can be built from estimates of yield components at any stage of the season before harvest.



Click on the “Yield components” option in the list in the “Estimate from” box in the “Weight/metre” component area. The “flow” will take a different path to the one after selection of a Segment sampling with “Kilograms” data.

Estimating bunches per metre

The first component in the “Yield components” flow path is “Bunches/metre”. Click on the ▼ symbol at the right of the “Estimate from sampling” box. You will see a list of Segment samplings for which “Bunches” data is available.



If you select a date the estimate of mean bunches/metre derived from the sampling will be displayed, together with the upper and lower limits of Doubt.

Estimating bunch gain or loss

When you have selected a sampling to provide an estimate of

The screenshot shows a sequence of input fields in a software application. The first field is 'Metres Row / Lot' with the value '3732 m'. An arrow points down to the 'Weight / Metre' section, which has a dropdown menu set to 'Yield components'. Another arrow points right to the 'Bunches / Metre' section, which has a dropdown menu set to '30-Oct-2000' and displays 'Mean 15.58', 'Upper Limit 18.52', and 'Lower Limit 12.64'. A final arrow points down to the 'Bunch Gain / Loss Factor' section, which has a dropdown menu with a list of options: 'Manual', 'Historical Mean', 'Historical Maximum', 'Historical Minimum', 'Above average', 'Below average', 'Like 1998', and 'Like 1999'.

Bunches/metre, the next component area, “Bunch Gain/Loss Factor”, will appear. This offers a list of options like the ones described for Harvest Efficiency (see above).

When you have selected an option for estimating the Bunch Gain/Loss Factor the Value will be displayed, together with the upper and lower limits of Doubt.

Estimating weight per bunch

When you have estimated a Bunch Gain/Loss Factor, the next component area, “Weight/Bunch”, will appear. This offers a list of options.

The screenshot shows two sections of a software application. The top section is 'Bunch Gain / Loss Factor' with a dropdown menu set to 'Historical Mean' and displays 'Mean 1.05', 'Upper Limit 1.17', and 'Lower Limit 0.94'. An arrow points down to the 'Weight / Bunch' section, which has a dropdown menu with a list of options: 'Manual', 'Historical Mean', 'Historical Maximum', 'Historical Minimum', 'Above average', 'Below average', 'Like 1998', and 'Like 1999'.

Estimates of Weight/bunch at harvest can be based on:

- A manual estimate
- A value from a previous year
- An historical statistic
- An estimate of mean weight/bunch derived from a sampling in the current season adjusted for weight gain between the time of sampling and harvest
- An estimate of mean berries/bunch derived from a sampling in the current season adjusted for berry loss between the time of sampling and harvest and multiplied by an estimate of harvest weight/berry.

The methods for estimating Weight/bunch from a manual estimate, value from a previous year or historical statistic follow the same procedures as for Harvest Efficiency and Bunch Gain/Loss Factor (see above).

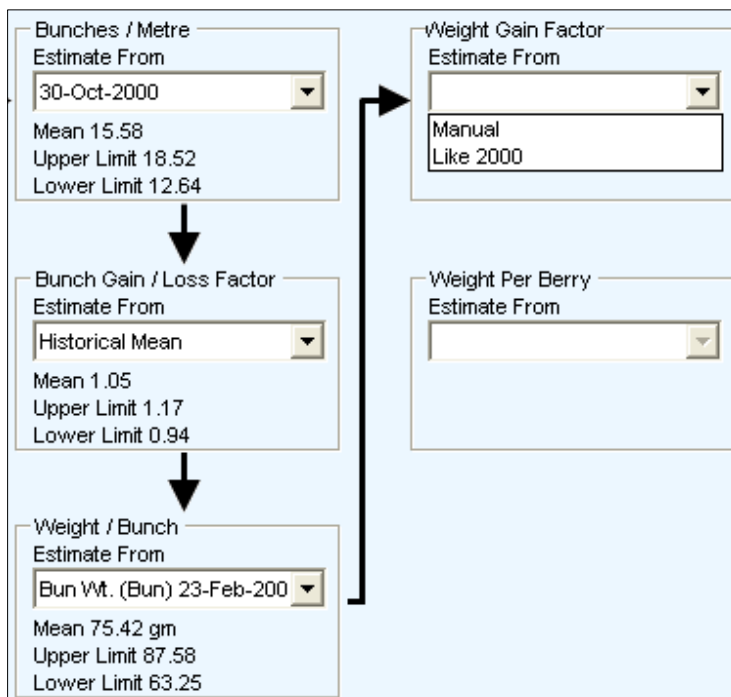
Estimating harvest weight per bunch from in-season weight per bunch

Grape Forecaster allows you to estimate harvest weight per bunch from a mean weight per bunch of a bunch sample. To do this you also need to predict a “Weight gain” factor.

The options in the “Estimate from” list in the “Weight/bunch”

component area that start with “Bun.Wt...” refer to samplings from which a mean weight per bunch can be calculated. A mean weight per bunch can be calculated in two ways:

1. from a sample of segments if both “Bunches” and “Kilograms” data is available
2. from a sample of bunches for which “Bunch grams” data is available



An estimate of mean weight per bunch derived from segment data is indicated by “(Seg)” and one from bunch data is indicated by “(Bun)”.

If you click on a “Bun.Wt.” type of sampling, the Value will be displayed, together with the upper and lower limits of Doubt, and the next component area, “Weight Gain Factor”, will appear. This offers a list of options like the ones described for Harvest

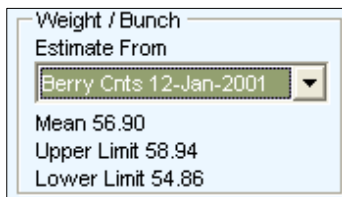
Efficiency and Bunch Gain/Loss Factor, and the methods for estimating the Value and Doubt Limits are the same (see above).

When you have estimated a Weight Gain Factor, the “Harvest Efficiency” component area will appear, and you can estimate it as described above to complete the forecast.

Estimating harvest weight per bunch from berries per bunch

Grape Forecaster allows you to estimate harvest weight per bunch from the mean berries per bunch of a bunch sample. To do this you also need to predict a “Berry loss” factor and a mean weight per berry at harvest.

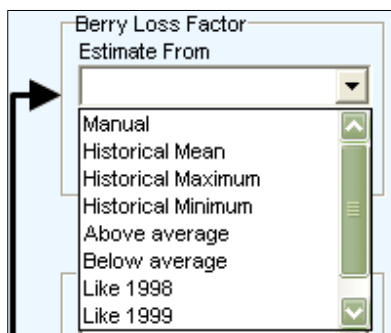
The options in the “Estimate from” list in the “Weight/bunch” component area that start with “Berry Cnts...” refer to bunch samplings for which “Normal berries” data has been entered.



If you click on a “Berry Cnts” type of sampling, the Value will be displayed, together with the upper and lower limits of Doubt, and the next component area, “Berry Loss Factor”, will appear. This offers a list of options like the ones

described for Harvest Efficiency, Bunch Gain/Loss Factor and

Weight Gain Factor, and the methods for estimating the Value and Doubt Limits are the same (see above).



When you have estimated a Berry Loss Factor, the next component area, “Weight per berry” will appear. This offers a list of options like the ones described for Harvest Efficiency, Bunch

Gain/Loss Factor, Weight Gain Factor and Berry Loss Factor, and the methods for estimating the Value and Doubt Limits are the same (see above).

Bunches / Metre Estimate From 30-Oct-2000 Mean 15.58 Upper Limit 18.52 Lower Limit 12.64	Berry Loss Factor Estimate From Historical Mean Mean 0.85 Upper Limit 0.85 Lower Limit 0.84
Bunch Gain / Loss Factor Estimate From Historical Mean Mean 1.05 Upper Limit 1.17 Lower Limit 0.94	Weight Per Berry Estimate From Historical Mean Mean 0.85 Upper Limit 0.85 Lower Limit 0.84
Weight / Bunch Estimate From Berry Cnts 12-Jan-2001 Mean 56.90 Upper Limit 58.94 Lower Limit 54.86	

When you have estimated a Weight per berry, the “Harvest Efficiency” component area will appear, and you can estimate it as described above to complete the forecast.

Estimating weight per metre from harvest bunch counts and weights

If you wish to build an estimate of Weight/metre from estimates of bunches/metre and weight/bunch derived from samplings near harvest:

1. Select the segment sampling measured near harvest for which “Bunches” data has been entered
2. Set the Bunch Gain/Loss Factor using the “Manual” option with a Value of 1.0 and 0% Doubt
3. Select the bunch sampling measured near harvest for which “Bunch grams” data has been entered (logically it would a “Bun. Wt. (Bun)” type)
4. Set the Weight Gain Factor using the “Manual” option with a Value of 1.0 with 0% Doubt
5. Set Harvest Efficiency as usual

This will make a type of forecast referred to as “Harvest sampling” in Excel workbook versions of Grape Forecaster.

Exercise 11: Making and saving forecasts

1. Ensure you are using the Demonstration Data (access this via *Utilities / Switch to Demonstration Data*)
2. Select the “Forecasting exercise” Lot in the 2001 season.
3. Click on the **Generate Forecasts** button.
4. Make and save the forecasts shown in the following examples, giving them the names in their headings.
5. Experiment with the large range of forecasting options Grape Forecaster offers

Bunch counting

Forecast for Lot : Forecasting Exercise

Select History From: Forecasting Exercise [Save] [Close]

Metres Row / Lot: 3732 m

Weight / Metre Estimate From: Yield components

Bunches / Metre Estimate From: 30-Oct-2000
 Mean 15.58
 Upper Limit 18.52
 Lower Limit 12.64

Berry Loss Factor Estimate From: []

Bunch Gain / Loss Factor Estimate From: Historical Mean
 Mean 1.05
 Upper Limit 1.17
 Lower Limit 0.94

Weight Per Berry Estimate From: []

Weight / Bunch Estimate From: Historical Mean
 Mean 122.23
 Upper Limit 140.00
 Lower Limit 104.46

Harvest Efficiency Estimate From: Historical Mean
 Mean 96.11
 Upper Limit 109.89
 Lower Limit 82.33

Most likely results:
 Yield = 5.76 tonnes / hectare (Doubt 4.07 to 7.46) from 1.2501 hectares
 Delivery = 7.20 tonnes (Doubt 5.09 to 9.32)

Berry counting

Forecast for Lot : Forecasting Exercise

Select History From: Forecasting Exercise Save Close

Metres Row / Lot: 3732 m

Weight / Metre
Estimate From: Yield components

Bunches / Metre
Estimate From: 30-Oct-2000
Mean 15.58
Upper Limit 18.52
Lower Limit 12.64

Berry Loss Factor
Estimate From: Historical Mean
Mean 0.85
Upper Limit 0.85
Lower Limit 0.84

Bunch Gain / Loss Factor
Estimate From: Historical Mean
Mean 1.05
Upper Limit 1.17
Lower Limit 0.94

Weight Per Berry
Estimate From: Manual
Mean 1.17
Upper Limit 1.37
Lower Limit 0.97

Weight / Bunch
Estimate From: Berry Cnts 12-Jan-2001
Mean 56.90
Upper Limit 58.94
Lower Limit 54.86

Harvest Efficiency
Estimate From: Historical Mean
Mean 96.11
Upper Limit 109.89
Lower Limit 82.33

Most likely results:
Yield = 2.66 tonnes / hectare (Doubt 1.83 to 3.48) from 1.2501 hectares
Delivery = 3.32 tonnes (Doubt 2.29 to 4.35)

Harvest sampling

Forecast for Lot : Forecasting Exercise Save Close

Select History From: Forecasting Exercise

Metres Row / Lot: 3732 m

↓

Weight / Metre
Estimate From: Yield components

Bunches / Metre
Estimate From: 23-Feb-2001
Mean 20.50
Upper Limit 24.45
Lower Limit 16.55

Weight Gain Factor
Estimate From: Manual
Mean 1.00
Upper Limit 1.00
Lower Limit 1.00

Weight Per Berry
Estimate From:

↓

Bunch Gain / Loss Factor
Estimate From: Manual
Mean 1.00
Upper Limit 1.00
Lower Limit 1.00

Weight / Bunch
Estimate From: Bun Wt. (Bun) 23-Feb-200
Mean 75.42 gm
Upper Limit 87.58
Lower Limit 63.25

↓

Harvest Efficiency
Estimate From: Historical Mean
Mean 96.11
Upper Limit 109.89
Lower Limit 82.33

Most likely results:
 Yield = 4.44 tonnes / hectare (Doubt 3.18 to 5.69) from 1.2501 hectares
 Delivery = 5.55 tonnes (Doubt 3.97 to 7.12)

Segment picking

✖
Forecast for Lot : Forecasting Exercise

Select History From Forecasting Exercise
Save Close

Metres Row / Lot
 3732 m

Weight / Metre
 Estimate From
23-Feb-2001

Mean 1.67 Kg/m
 Upper Limit 4.52
 Lower Limit -1.18

Bunches / Metre
 Estimate From

Weight Gain Factor
 Estimate From

Bunch Gain / Loss Factor
 Estimate From

Weight Per Berry
 Estimate From

Weight / Bunch
 Estimate From

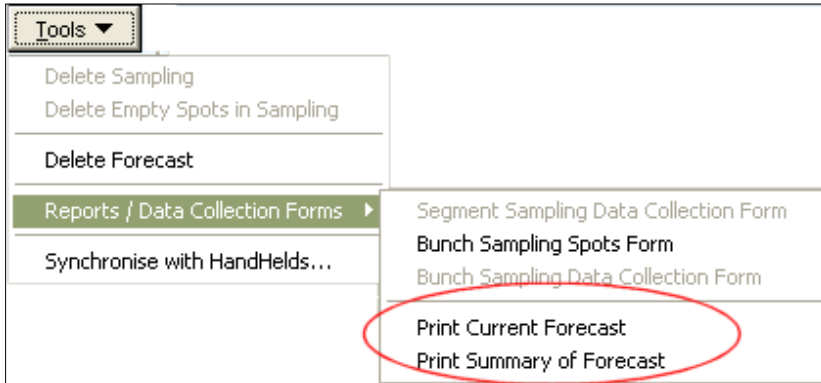
Harvest Efficiency
 Estimate From
Historical Mean

Mean 96.11
 Upper Limit 109.89
 Lower Limit 82.33

Most likely results:
 Yield = 4.78 tonnes / hectare (Doubt 0.00 to 18.10) from 1.2501 hectares
 Delivery = 5.98 tonnes (Doubt 0.00 to 22.62)

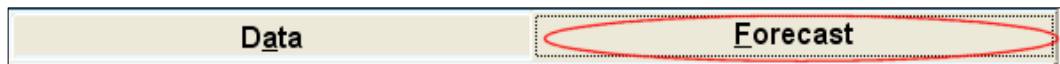
Printing saved forecasts

Grape Forecaster provides you with options to print out two basic types of report on saved forecasts.



The menu options for printing your saved forecasts are found on the *Tools* menu

Firstly select the Forecast tab on the main screen ...

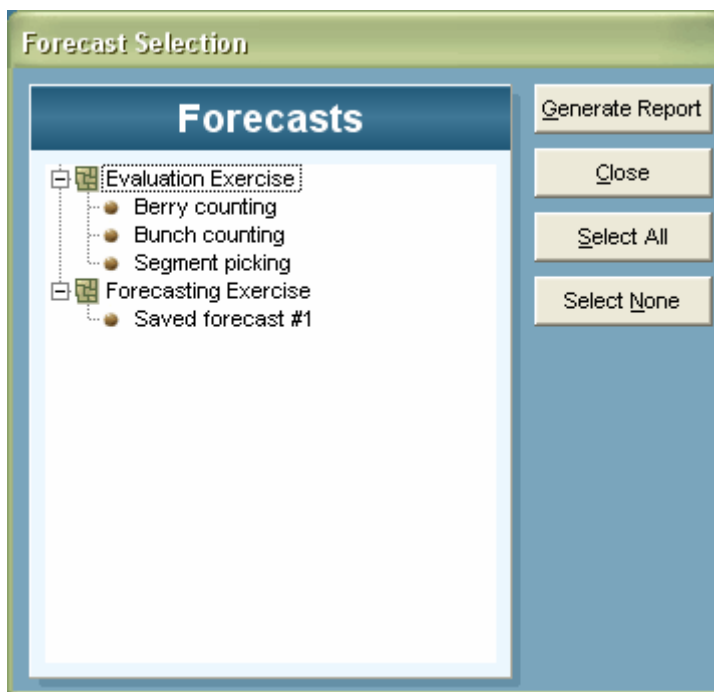


Then use the *Tools* menu to print your required report. To print the report shown below, simply highlight the appropriate forecast on the Forecast tab and choose *Print Current Forecast*

Demonstration Data		Page 1
	Forecast Report for Lot Forecasting Exercise	
Forecast	Saved forecast #1	
Date of Forecast:	6-Nov-2003	
Date of Last Sampling:	23-Feb-2001	
Most Likely Delivery:	914.10 Tonnes	
Upper Limit:	915.06 Tonnes	
Lower limit:	913.82 Tonnes	
Area:	1.25 Hectares	
Yield:	731.19 Tonnes/Hectare	
Signed By:	
Signature:	

The above report could be described as a “forecast certificate”. It contains the following information:

- The Lot and Season for which the forecast was made
- The name you gave to the forecast
- The date you made the forecast
- The date of the last sampling on which the forecast was based
- The most likely delivery
- Upper and lower limits of the range of Doubt
- The area of the Lot
- The most likely yield (delivery / area)
- A place to identify the authoriser of the forecast
- A place for the authoriser of the forecast to sign it



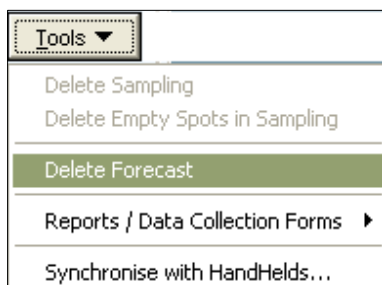
To print out a summary of forecasts, choose *Print Summary of Forecast* and you will see this report selection window:

This window enables you to select one all or several of your forecasts.

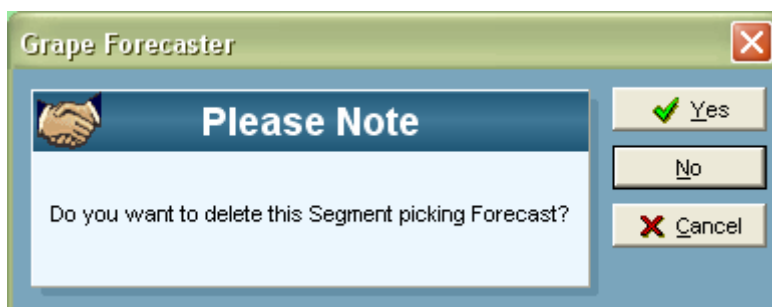
The forecast summary report looks like this:

Demonstration Data				Page 1	
Summary of selected forecasts					
Lot Description	Sample Date	Forecast Description	Forecast Date	Delivery (Tonnes)	
Forecasting Exercise	23-Feb-2001	Saved forecast #1	6-Nov-2003	914.10	

Deleting a Forecast



To delete a forecast, first select that forecast on the Forecasts tab then use the *Tools / Delete Forecast* option. Grape Forecaster will ask for your confirmation and name the forecast it is about to delete, like this ...



By default the **No** button is selected, therefore you must click on the **Yes** button to perform this task. Pressing your Enter key will select **No**.