

The GCP phenotype template wizard

A user's manual

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1. Introduction

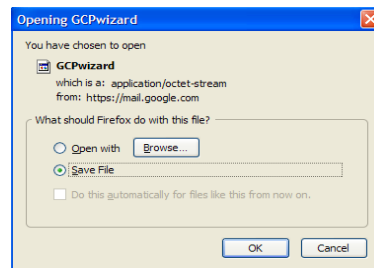
The phenotype template wizard has been developed through an SP4 commissioned project (G4008.31). The intention of the wizard is to help users (in the first instance GCP PIs involved in phenotyping experiments) to assemble their data in a form which is compatible with the requirements for the GCP Central Registry, and to capture as much as possible of the metadata surrounding their experiments. The program runs as an add-in to Microsoft Excel, and can be executed in either a Office 2003 or an Office 2007 environment. The manual is designed to be free-standing, but can best be followed in conjunction with the set of animated videos illustrating the use of the wizard, which have been made available [here](#).

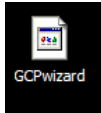
2. First steps


2.1. Extracting the wizard

The programme will normally be delivered electronically, in the form of a self-extracting compressed file called "GCPwizard" which has no file extension.

When this is downloaded from your email account, you will see this pop-up message:

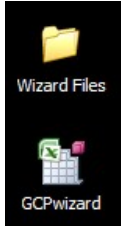


Select "Save File" and then "OK". You will now see  on your desktop.

To extract the program, right click on this icon, select "Rename",  then add .exe to the end of the filename.

Next, double click on the renamed icon. A pop-up box will appear:



Select "Run", extract to your desktop. You will see  on your desktop.

Move the folder named "Wizard Files" into your "My Documents" folder. Leave the GCPwizard icon on your desktop.

2.2 Setting the security level in Excel

Because the program contains macros, you may have to relax the security settings in Excel to allow the program to work. The easiest way to learn how to do this is to follow the relevant video. [Office 2003](#) or Office 2007

2.2.1 Office 2003

Double click the wizard icon; this will open Excel

Click OK on the dialog box which opens

From the Tools menu, select "Security", and "Medium" on the Security level tab

Press OK

Then exit from Excel

2.2.2 Office 2007

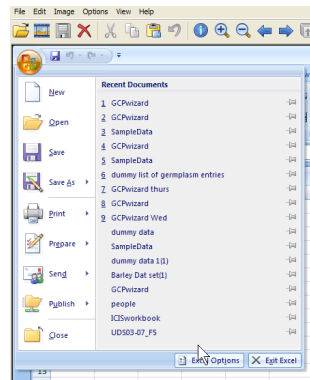
Double click the wizard icon
select "Enable Macros".



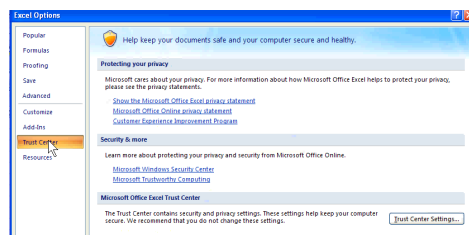
- this will open Excel. A security message appears -

Then:

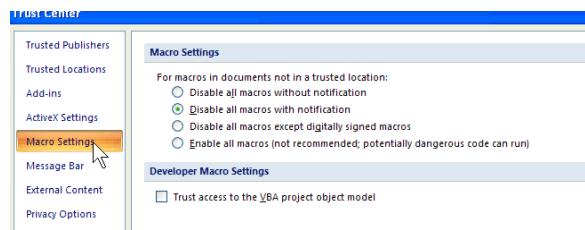
Select "Excel Options"



Then "Trust Center"



Then "Trust Center Settings", followed by "Macro Settings". Choose "Disable all macros with notification", then click "OK" twice



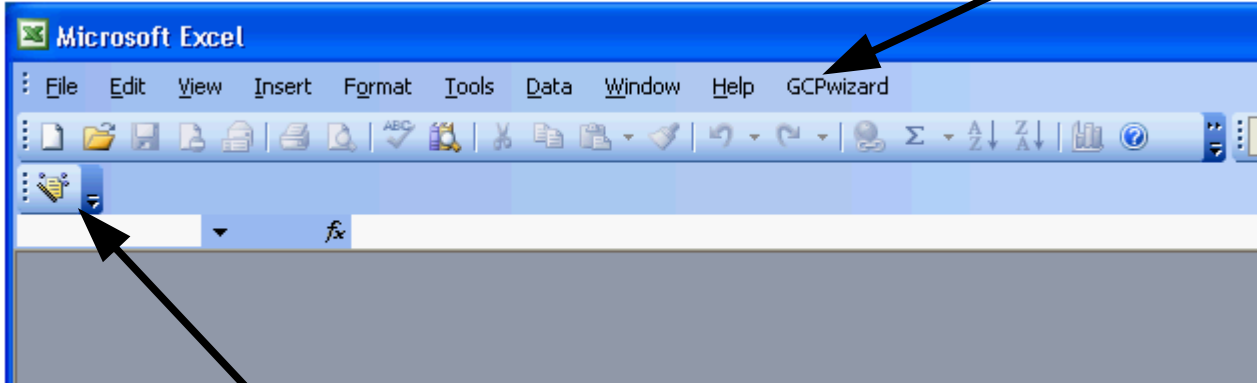
Finally, exit from Excel.

2.3. Opening the wizard in Excel

The wizard only works within Excel (2003 or 2007).

2.3.1. Office 2003 demonstrated [here](#)

Double click the wizard icon. This opens Excel. A security message appears - select "Enable Macros". You will see that a new menu item "GCPwizard" appears next to the Help button.

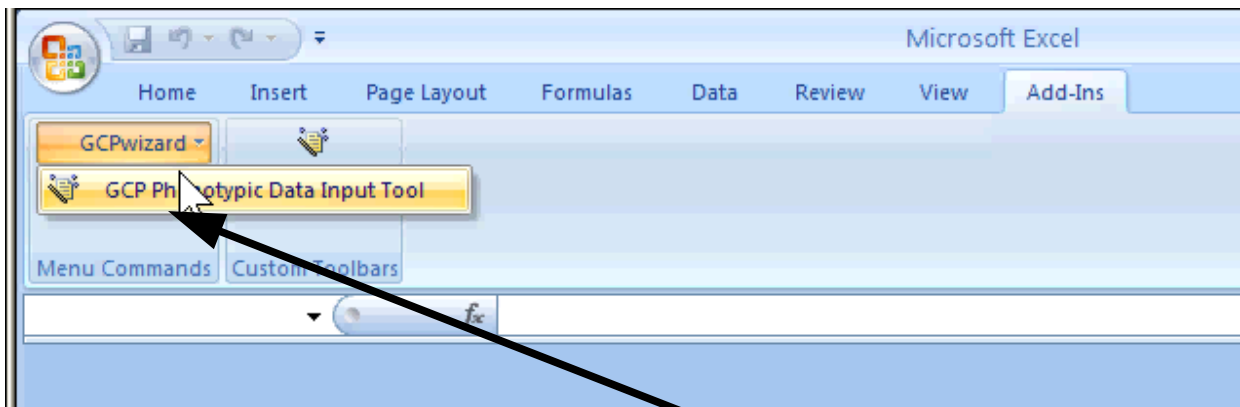


Clicking here opens the wizard

2.3.2 Office 2007 demonstrated [here](#)

Double click the wizard icon  this opens Excel.

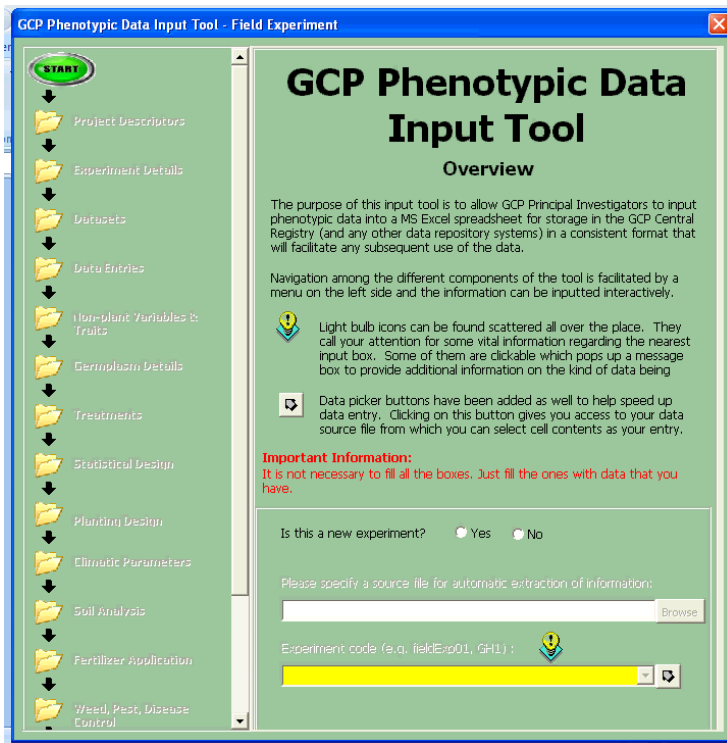
A security message appears - select "Enable Macros".
Select "Add-Ins" from the top menu (next to "View")



To open the wizard, select the "GCP Phenotyping Data Input Tool" option under the GCPwizard tab.

3. Front page

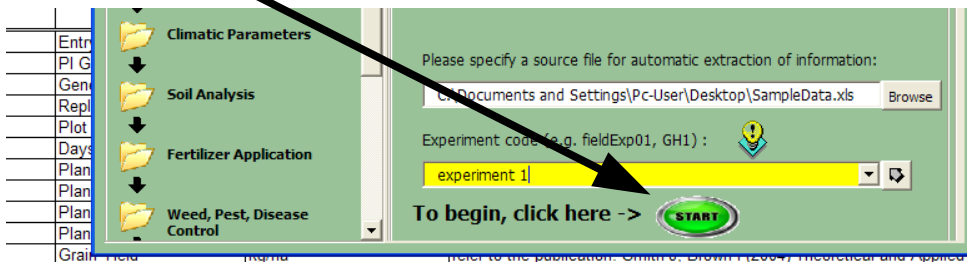
The front page shows a "Navigation Panel" on the left (this will be visible throughout), which indicates where the user is in the program, and some self-explanatory text on the right.



The user begins by indicating whether this is the first time that a particular data set is being entered (a "New" experiment) or whether the experimenter has already saved some work and is returning to add more data.

For a "New" experiment, the user now needs to indicate the location and name of the Excel file containing the data. Specifying an Excel file here causes that file to be opened behind the wizard front page. It then needs to be given a name within the box titled "Experiment Code" (for example "Experiment 2008_1"; or "Glasshouse trial #5" etc.). This name must be unique to this data set and the system will remember it.

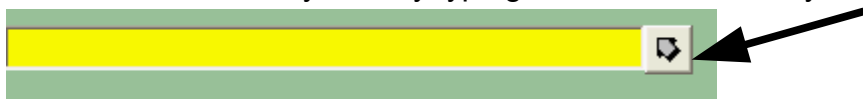
Once these two fields have been filled in, the wizard becomes "live" and the process can begin by pressing "Start".



genebank accession
International Rice Genebank


4. Project descriptors

This page collects a set of information which is important for GCP purposes as it defines which project produced the data being reported. Here, as throughout the wizard, data entry can be made either by directly typing into the boxes, or by using the "data picker".



This tool (demonstrated [here](#)) allows the user to transfer text or data from a pre-existing Excel file into the wizard.

NOTE : All fields shown in yellow are mandatory.

At the bottom of this (and later) pages, this button  allows the user to either move to the next page, or to save the input made so far.

5. Experiment details


This page captures information pertaining to the type of experiment being recorded and the environment where this experiment was carried out. Not all of this information is mandatory (only the yellow fields are mandatory), but if this information is obtainable or known, please include it.

A drop-down menu for "Crop species" gives a list of the GCP mandate crops from which the appropriate one should be selected.




The field can also be filled either manually, or by using the data picker.

Under "Environment type" three types are recognized: Field, Glasshouse and Growth chamber. Choose the appropriate one.

The second half of the page asks for geographical information of the experimental site. Obviously this is more important for field experiments than for glasshouse or growth chamber ones. If a single experiment involved trials at more than one site, then multiple sites can be detailed by using the  button. Multiple sites will then be shown in the table at the bottom of the page.

| Country | Province | Town | Site |
|---------|------------|------|-----------|
| India | Maharas... | Pune | Ananda... |

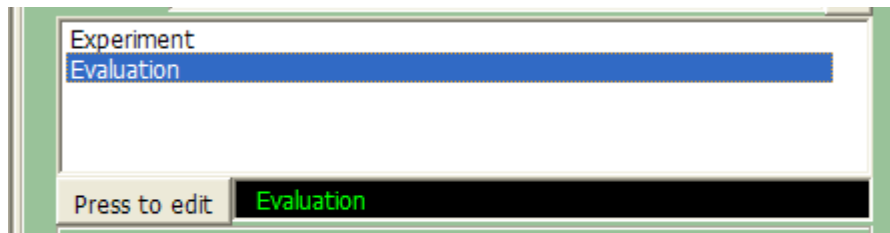
If an error is made at this point, individual entries in the table can be deleted by double-clicking on them.

Remember, when you are ready to move to the next page, press 

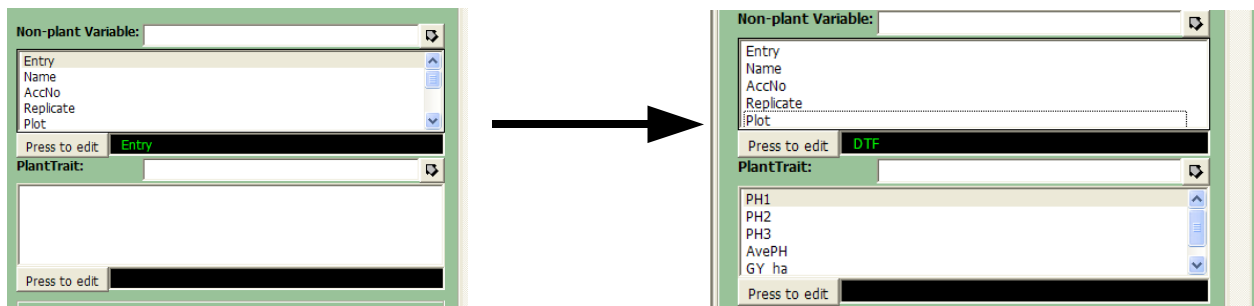
6. Datasets

The purpose of this page is to distinguish between “traits” and “non-plant variables”. “Traits” are measurements you have made on the plants (eg height, yield, flowering time) while “non-plant variables” refers to non-measured items such as replicate number, plot number or accession number.

First, the program needs to know which worksheet in your Excel file contains the trait and non-trait data. In the example below, the Excel file contains two sheets - "Evaluation" and "Experiment". The data is stored in the "Evaluation" sheet. (So, this is selected by clicking on it.)



When this is selected, all the column headings on the data sheet are listed by default as "Non-plant Variables". You now need to shift all those which are traits into the "Plant Trait" list. You can do this one at a time by selecting and dragging into the "Plant Trait" table. Or you can do it in one operation by holding down the “control” key and clicking on each of the plant traits in turn, then dragging the whole group into the "Plant Trait" table. Alternatively, you can use the “shift” key to select a group of items by indicating the first and last items in the group.



Remember, when you are ready to move to the next page, press

Next

7. Data entries

The purpose of this page is merely to check that your data have been correctly uploaded. If not, you will need to inspect your data file to make sure it has been set up properly.

The display should look something like this:

If OK, then move to the next page by pressing



| Entry | Name | Accto | Replicate | Plot | DTF |
|-------|-----------|-------|-----------|------|-----|
| 1 | V3M-10... | 18 | 1 | 1 | 56 |
| 1 | V3M-10... | 18 | 2 | 2 | 58 |
| 1 | V3M-10... | 18 | 3 | 3 | 56 |
| 2 | V3M-10... | 32 | 1 | 4 | 60 |
| 2 | V3M-10... | 32 | 2 | 5 | 68 |
| 2 | V3M-10... | 32 | 3 | 6 | 69 |
| 3 | V3M-10... | 36 | 1 | 7 | 56 |
| 3 | V3M-10... | 36 | 2 | 8 | 66 |
| 3 | V3M-10... | 36 | 3 | 9 | 62 |
| 4 | V3M-10... | 55 | 1 | 10 | 60 |
| 4 | V3M-10... | 55 | 2 | 11 | 69 |
| 4 | V3M-10... | 55 | 3 | 12 | 62 |
| 5 | V3M-10... | 56 | 1 | 13 | 64 |
| 5 | V3M-10... | 56 | 2 | 14 | 62 |
| 5 | V3M-10... | 56 | 3 | 15 | 69 |
| 6 | V3M-10... | 66 | 1 | 16 | 62 |
| 6 | V3M-10... | 66 | 2 | 17 | 62 |
| 6 | V3M-10... | 66 | 3 | 18 | 60 |
| 7 | V3M-10... | 69 | 1 | 19 | 69 |
| 7 | V3M-10... | 69 | 2 | 20 | 69 |
| 7 | V3M-10... | 69 | 3 | 21 | 69 |
| 8 | V3M-10... | 72 | 1 | 22 | 64 |
| 8 | V3M-10... | 72 | 2 | 23 | 66 |
| 8 | V3M-10... | 72 | 3 | 24 | 60 |
| 9 | V3M-11... | 75 | 1 | 25 | 69 |
| 9 | V3M-11... | 75 | 2 | 26 | 66 |
| 9 | V3M-11... | 75 | 3 | 27 | 62 |
| 10 | V3M-11... | 78 | 1 | 28 | 58 |
| 10 | V3M-11... | 78 | 2 | 29 | 62 |
| 10 | V3M-11... | 78 | 3 | 30 | 62 |
| 11 | V3M-11... | 81 | 1 | 31 | 69 |
| 11 | V3M-11... | 81 | 2 | 32 | 66 |
| 11 | V3M-11... | 81 | 3 | 33 | 62 |
| 12 | V3M-11... | 86 | 1 | 34 | 56 |
| 12 | V3M-11... | 86 | 2 | 35 | 64 |

8. Non-plant variables and traits

The purpose of this page is to fully explain the meaning of all the columns in your data set so that others are able to understand exactly what you have measured in your experiment and how you made these measurements.

Choose the items one by one, give the full name of each. Include a short description if the name is not 100% obvious.

Then, for the traits only, give details of units and methodology as requested.

After each item, press “add” and then run through the same process for the next item. If you have used a method which is published (as in the example above), give the citation. If your method is detailed as a text file on your computer, you should indicate the address of this file in the appropriate box.

As you enter these details, the table at the head of the page will gradually fill:

| Code | Name | Description | Unit | Method |
|-----------|----------------|-------------|------|------------|
| Entry | Entry | | no. | |
| Name | PI Germplas... | | code | |
| AcctoNo | Genebank A... | | no. | |
| Replicate | Replication | | no. | |
| Plot | Plot | | no. | |
| DTF | Days to Flo... | | days | anthesis |
| PH1 | Plant Height | | cm | height fr. |
| PH2 | Plant Height | | cm | height fr. |
| PH3 | Plant Height | | cm | height fr. |

Remember, when you are ready to move to the next page, press



9. Germplasm details

Here, the wizard is asking for details of the germplasm used in your experiments. Three different sorts of materials are envisaged: Genebank accessions, segregating populations and breeder's lines. In each case, the program asks you to provide as much information about the germplasm as you have available. The page should be largely self-explanatory.

The data should end up being displayed something like this:

| Entry | Germplasm code | Accession no. |
|-------|-------------------------|---------------|
| 1 | JIC2007/GCP drought #1 | 18 |
| 2 | JIC2007/GCP drought #2 | 32 |
| 3 | JIC2007/GCP drought #3 | 36 |
| 4 | JIC2007/GCP drought #4 | 55 |
| 5 | JIC2007/GCP drought #5 | 56 |
| 6 | JIC2007/GCP drought #6 | 66 |
| 7 | JIC2007/GCP drought #7 | 69 |
| 8 | JIC2007/GCP drought #8 | 72 |
| 9 | JIC2007/GCP drought #9 | 75 |
| 10 | JIC2007/GCP drought #10 | 78 |

Remember, when you are ready to move to the next page, press

Next

10. Treatments

The idea of this page is to record sets of different experimental treatments applied to the plants as part of the experiment, eg, droughted vs fully-watered, or varying amounts of fertilizer. If no such external treatments were applied, then the number of treatments can be left at the default value of 1, and you can pass directly to the next page. However, if the experiment involved comparing plant performance at different levels of moisture, nutrition, pest control, etc., then you can use this page to specify:

- how many different treatments there were
- what type of treatment was applied
- and what the individual treatments were

Enter the number of treatment: 3

Type of treatment: Water Regime

| Type | Description |
|--------------|----------------------------------|
| Water Regime | no supplementary irrigation |
| Water Regime | 25mm at sowing |
| Water Regime | 25mm at sowing, 25mm at anthesis |

Enter the number of treatment: 3

Type of treatment: Water Regime

Description of treatment: anthesis

Remember, when you are ready to move to the next page, press

Next

11. Statistical design

The wizard does not perform any statistical analysis, it merely records what your design was. The purpose here is to establish which columns in your data file define the plots, which ones the replicates, etc.

Use the data picker (or enter manually) to insert the appropriate headings from your data file in the relevant boxes on this page.

Statistical Design
Enter details of the experimental design used.

Experimental design: Randomized complete block
 Alpha lattice
 Latin square
 Split-Plot
 Other

Enter no. of Blocks: 3
Enter no. of Plots/Block: 100
Enter no. of Samples/Plot: 1

Select the corresponding labels from the worksheet:

Block: Block
Plot: Entry
Sample:

Remember, when you are ready to move to the next page, press



12. Planting design

This page is specific to field experiments and glasshouse ones where plants are grown directly in the ground (i.e., not in pots or in hydroponics). The information requested is self-explanatory.

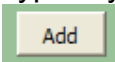
Remember, when you are ready to move to the next page, press



13. Climatic variables

Once again this page is specific to field trials. It records any measurements made of the weather conditions experienced during the experiment.

Typically, climatic variables are measured more than once during an experiment. Use the



feature (as outlined in §5) to move from one set of measurements to the next.

The table at the head of the page summarizes the input:

| Entry ID | Treatm... | Period | Min. T... | Max. T... | Wind S... | H... |
|----------|-----------|-----------|-----------|-----------|-----------|------|
| 1 | | 15/03/... | 23 | 36 | | |
| 2 | | 01/05/... | 23 | 36 | | |
| 3 | | 30/07/... | 23 | 36 | | |

Date of Measurement: 30/07/2007
Time of Measurement: 11:00

Minimum daily temperature (centigrade): 23
Method of measurement: thermometer

Maximum daily temperature (centigrade): 36
Method of measurement: thermometer

Average daily wind speed (km/hr):
Method of measurement:

Remember, when you are ready to move to the next page, press



14. Soil analysis

This page looks very detailed, but probably most experimenters will have collected little (if any) of this type of data. Just fill in as much of this information as you have.

Remember, when you are ready to move to the next page, press

Next

15. Fertilizer application

If fertilizer application was not specified as a *treatment* (see §10), then this page asks what the fertilizer regime was for the entire experiment. Fertilizer may have been added on more than one occasion during the trial. To record successive fertilization events, use the "Add" button. A summary of the input appears in the table at the top of the page.

Fertilizer application type:

Rate of application:

Unit of application rate:

Method of application:

Date of application: (dd/mm/yyyy)

However, if fertilizer application was specified as a treatment, the page will show an extra box ("Treatment"). In this case, the type, application rate and method, and timing of each treatment are entered in the same way.

Fertilizer Application

Enter details of the fertilizers applied.

| Entry ID | Treatment | Fertilizer | Rate | Unit | Mk |
|----------|------------|-------------|------|-------|----|
| 1 | treatment1 | NPK 18-5... | 100 | kg/ha | br |
| 2 | treatment1 | NPK 18-5... | 150 | kg/ha | br |
| 3 | treatment2 | NPK 18-5... | 100 | kg/ha | br |
| 4 | treatment2 | NPK 18-5... | 150 | kg/ha | br |

Treatment:

Fertilizer application type:

Rate of application:

Unit of application rate:

Method of application:

Date of application: (dd/mm/yyyy)

Remember, when you are ready to move to the next page, press

Next

16. Weed, pest, disease control

This page works in exactly the same way as the previous one ("Fertilizer Application").

Remember, when you are ready to move to the next page, press

Next

17. Water availability

This page records 1) the water status of the soil at planting and 2) any changes caused by rainfall which occurred during the trial. If irrigation rate was a *treatment* (see §10), then each treatment is specified separately as in §15 and §16.

Remember, when you are ready to move to the next page, press

Next

18. Extreme environmental events

This page records any individual climatic event (eg flood, storm, etc) which is considered to have had a possible effect on all, or part of the trial. Complete the boxes as appropriate.

Remember, when you are ready to move to the next page, press

19. Final page ("Done")

At this point, the process is completed. If the button is chosen, then the program converts the dataset into the ICIS-compatible format required for submission to the GCP Central Registry.

If further changes are anticipated, then the option should be chosen.

Variation for experiments not conducted in the field

While the majority of GCP experiments are expected to be field trials, other experimental situations are also anticipated - in particular, growing plants in a glasshouse or in a growth chamber. Here, plants could be raised either in pots or in liquid culture (hydroponics). As most of what has been described in this manual to this point applies equally to all kinds of experiment, what follows outlines only the variations in the program relevant for glasshouse or growth chamber experiments.

The user will have stated on the "Experiment Details" page (see §5) whether the data relate to a field, glasshouse or growth chamber experiment.

Glasshouse-based experiments

Selecting "Glasshouse" at §5 induces a few changes in the navigation panel.

The first major one is the appearance of an "Agronomic practices" page to replace the "Planting design" page. Here, the program asks whether the experiment was based on planting directly into soil, or into pots, or involved hydroponics.

Agronomic Practices
Enter details of the agronomic practices used.

Soil-based

Planting directly in soil

Distance between plants (cm):

Distance between rows (cm):

Planting in pots

Volume of pot (liters):

Number of pots per square meter:

Hydroponics-based

Distance between adjacent plants within a tray:

Distance between adjacent trays:

The option "planting directly in soil" leads into the same sequence as the field experiment type shown earlier.

If "planting in pots" is selected, then the size of each pot, and plant density (number of pots per square meter) need to be specified.

In hydroponics experiments, the distance between adjacent plants within a tray, and the distance between adjacent trays (if more than one tray was used) are required.

Since it is possible to control a number of climatic parameters in a glasshouse, the next change is that the "Climatic variables" page (§13) is replaced by a "Climate control" page.

Date of Measurement: (dd/mm/yyyy)

Time of Measurement: (hh:mm)

Minimum daily temperature (centigrade): Method of measurement:

Maximum daily temperature (centigrade): Method of measurement:

Ave. daily relative humidity (percentage): Method of measurement:

Photoperiod (hours):

If supplementary lighting was given, what light source was used:

Light intensity (lux): Method of measurement:

Here, there is the possibility of specifying both the length of the photoperiod and the type of supplementary lighting. These are entered in the normal way. If the lighting regime was altered during the experiment, then each of the various conditions can be specified using the button.

The last major change applies to the watering regime for glasshouse experiments carried out in pots, since water supply can be fully controlled in a glasshouse.

Here, the system asks whether or not the plants were deliberately moisture stressed, and if so, at what stage(s) in the growing cycle the stress was imposed.

Hydroponics-based experiments

In these experiments, there is no longer any need for soil analysis, fertilizer application or watering regime, so these are all replaced by a "Hydroponics Analysis" page.

This page records the concentration of each nutrient/other compound present in the culture solution. It also collects details of the frequency with which the solution was refreshed.

Growth chamber - based experiments

Selecting "Growth Chamber" at §5 induces only minor changes from the Glasshouse option. The most significant is on the "Agronomic Practices" page, where the options are reduced to "Pots in Soil" and "Hydroponics".