



BANANA TRACKER USER MANUAL



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1. Introduction

1.1 Purpose of the BananaTracker Software

QUTracker is QUT's proprietary software for tracing and tracking plant transgenic events and for efficient handling of data generated from large-scale transformation projects that are expected to lead to GM product release, e.g. the QUT-BIRAC project.

It has core administration modules, data entry modules and biological entity tracing modules for Vector management, Explant management, Transformation Event Management, Plant/Progeny Management (from lab to field) and Phenotype Data Management.

All modules have a query function and there is an overarching module for tracing each biological entity in the transgenic generation and product development pipeline. It manages, preserves and tracks large inventories of transgenic germplasm and enables efficient and accurate record keeping of the large quantities of experimental data. It automates and seamlessly integrates multi-step experimental processes.

It also incorporates label-making utilities, enabling accurate labelling of plant tissue culture vessels and plants, all the way from tissue culture through to the field.

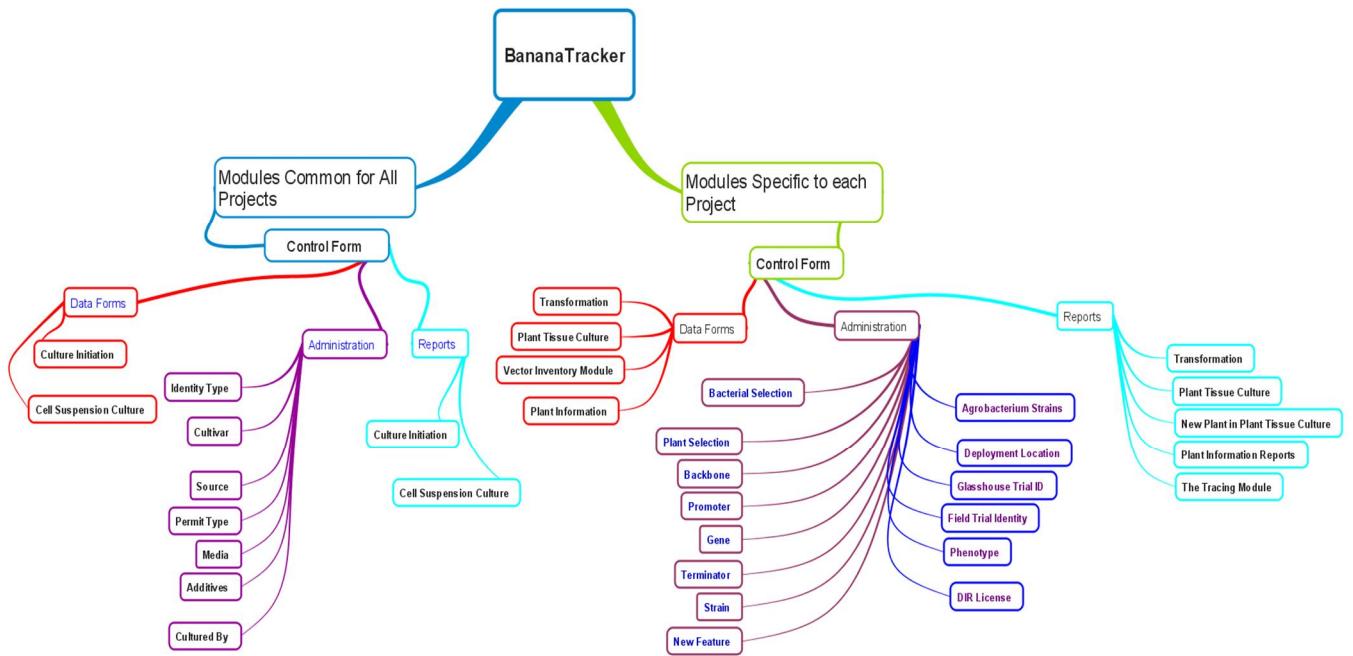
One special feature of the software is its ability to enforce data quality, regulatory compliance and consistency through in-built error-checking, based on lab procedures. It provides a "single source of truth" through centralised data storage.

QUTracker supports all generic GM event generation and product development processes and can be readily adapted to different crops.

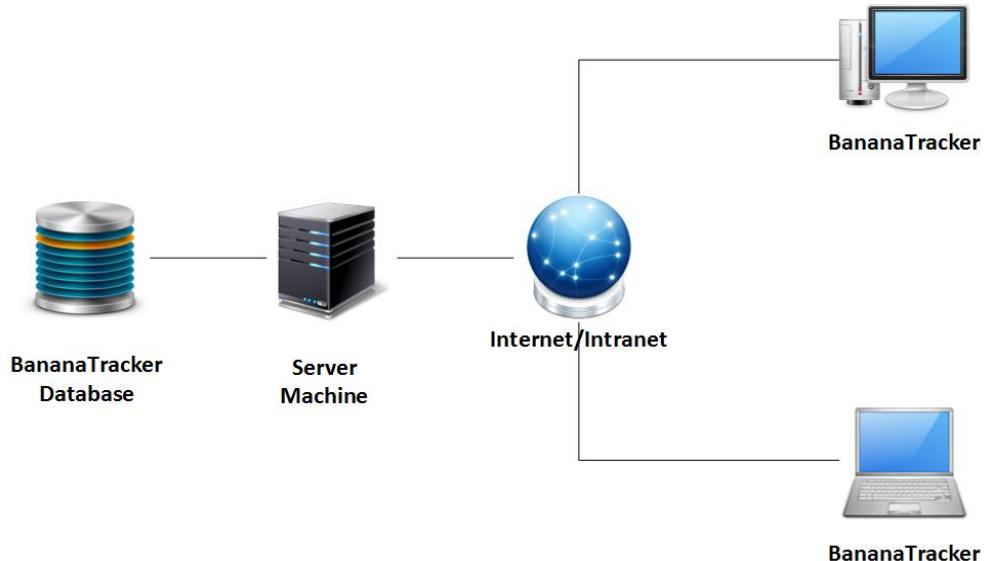
Banana Tracker is QUTracker modified for banana specific projects.

Dr (Ms) Harjeet Khanna

1.2 Structure of BananaTracker



1.3 BananaTracker Deployment Architecture



All the screenshots are taken with CTCB BananaTracker with Sample data.

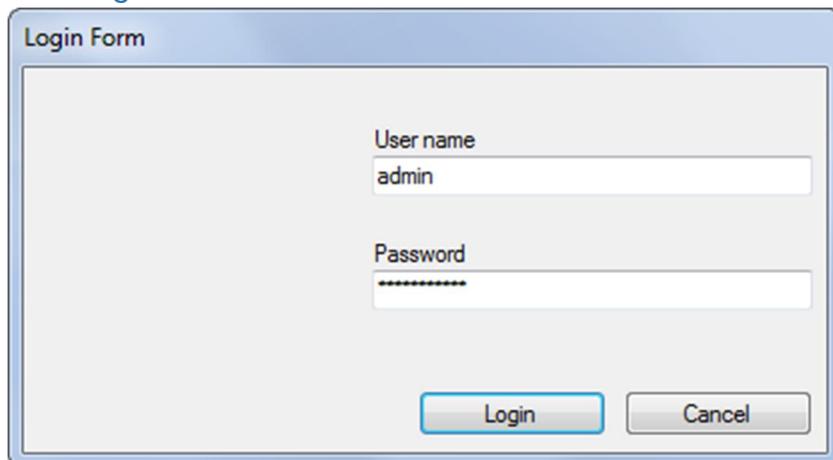
2. BananaTracker Administration Tool

2.1 Purpose

Banana Tracker administration tool is used for creating user accounts and assigning projects and privilege levels to users of BananaTracker.

This tool should be restricted only for the administrator of BananaTracker.

2.2 Login



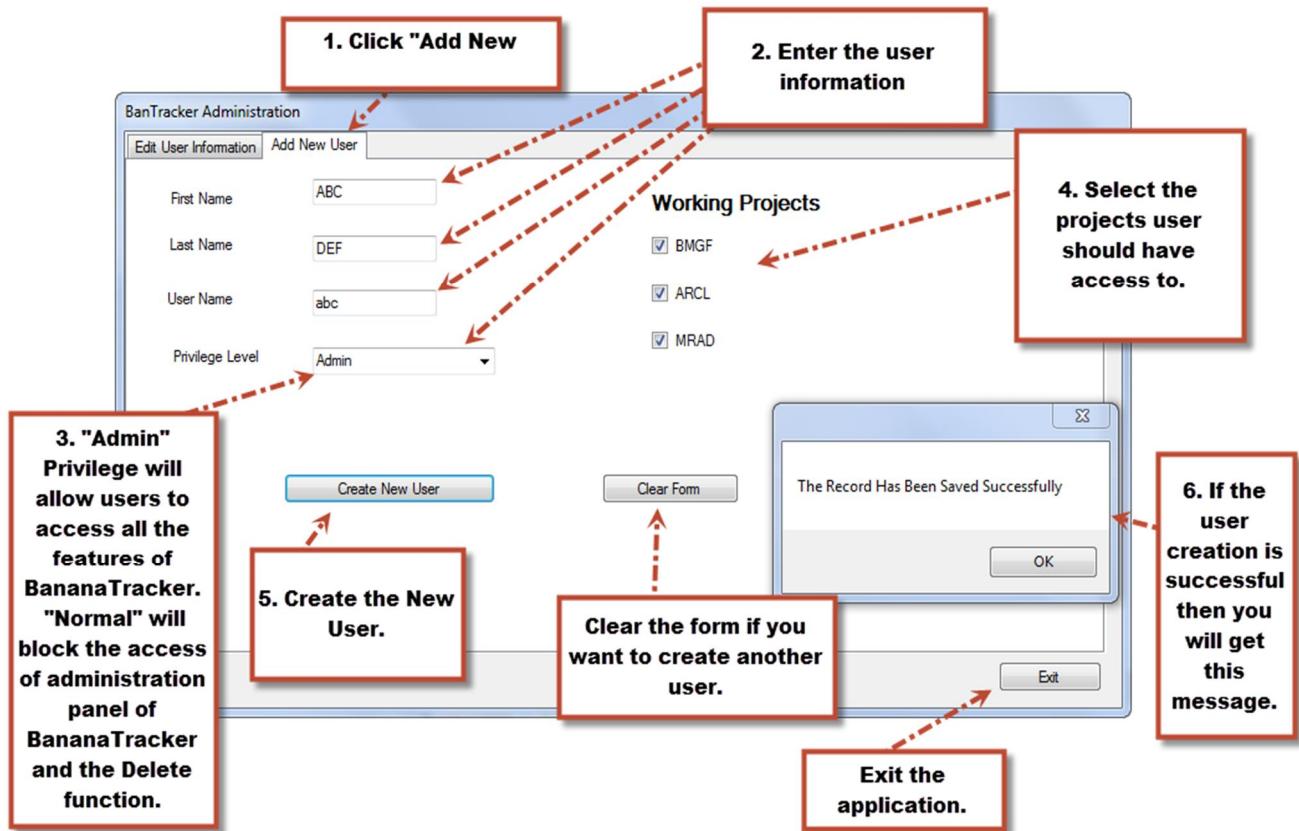
The image shows a 'Login Form' dialog box. It has a title bar labeled 'Login Form'. Inside, there are two text input fields: 'User name' containing 'admin' and 'Password' containing '*****'. At the bottom are two buttons: 'Login' (highlighted with a blue border) and 'Cancel'.

User Name:- admin

Password:- (Use the password provided)

2.3 Creating a new user

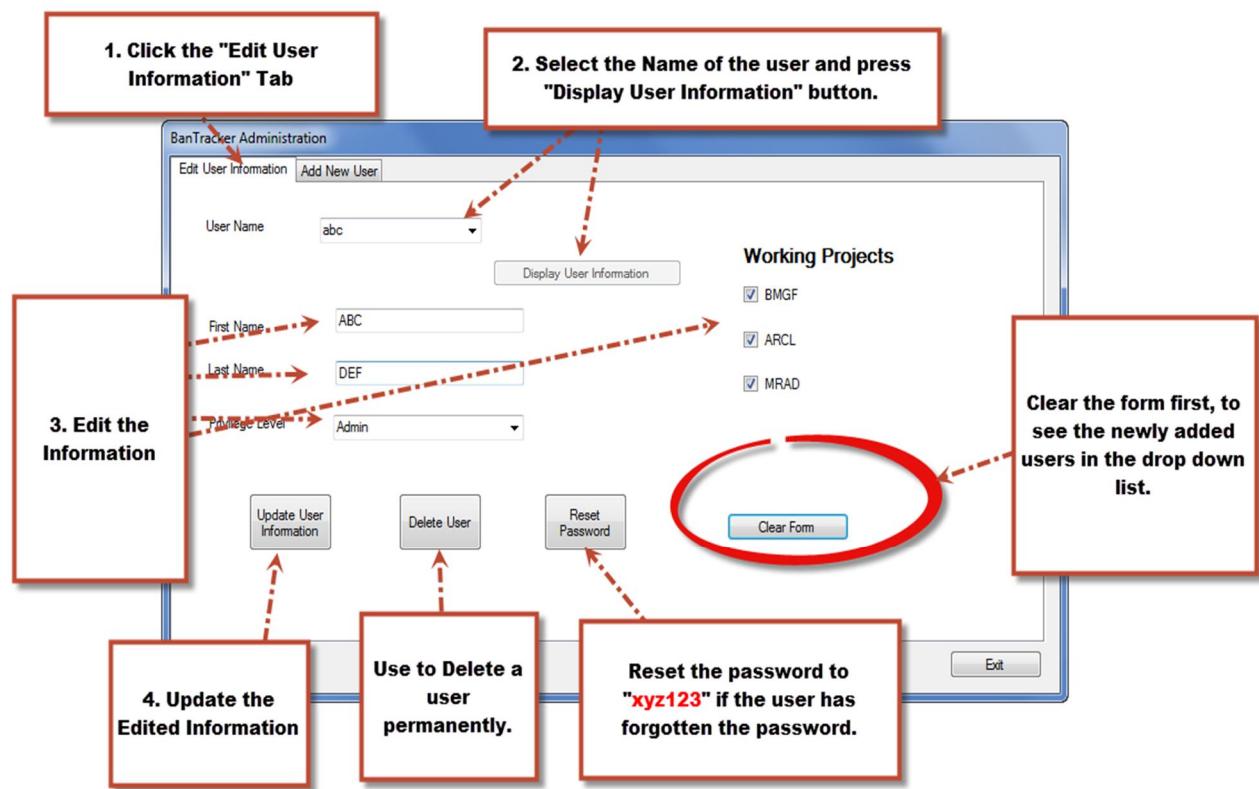
Only the users added by BananaTracker Administrator have access to data.



Initial Password for all the new users will be "**xyz123**"

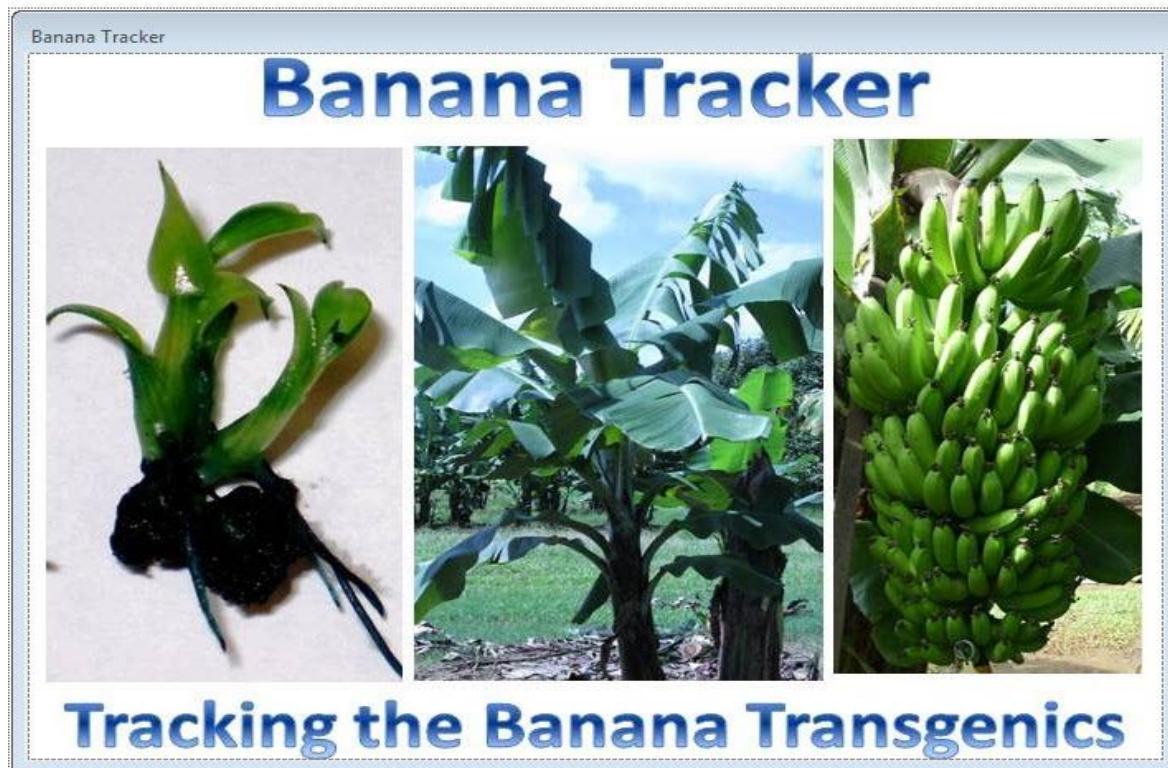
They can change their passwords after login to BananaTracker.

2.4 Editing Existing User Information

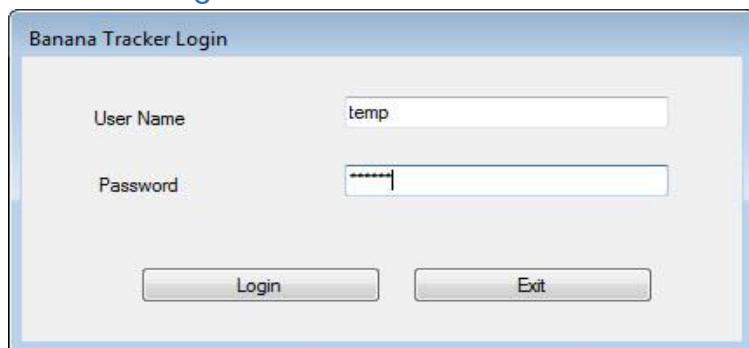


3. BananaTracker Software

3.1 Initial Splash Screen



3.2 Login

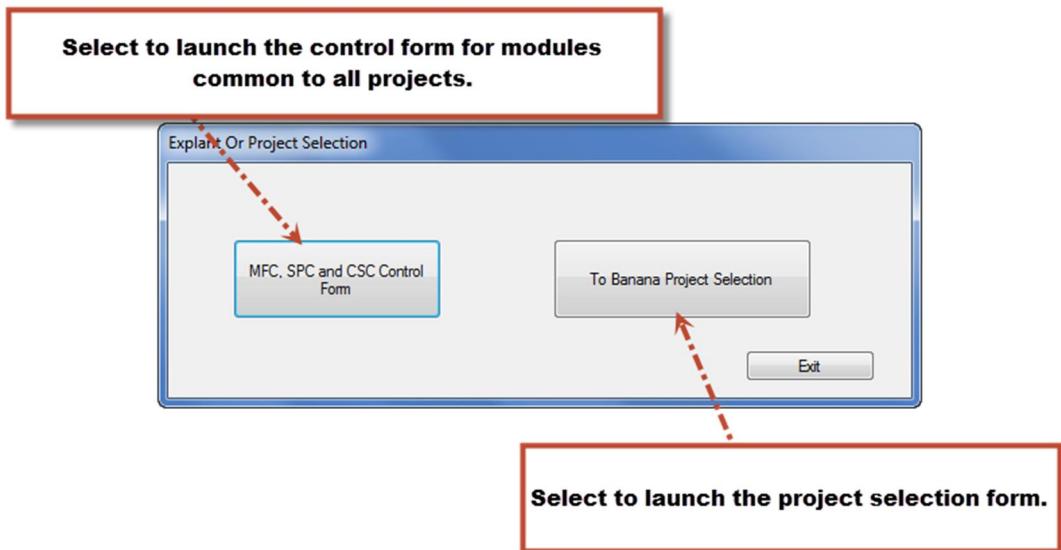


The user name and password to login to Banana Tracker will be initially created by the Administrator. Your initial password will be "**xyz123**". After you login you can change your password at any time.

The password you create is encrypted. Nobody else except you will know the password. If you forget the password please contact the Administrator. He/She will reset your password back to "**xyz123**".

Please remember that this login has no relationship with your institute's Staff login.

3.3 Explant or Project Selection



3.4 MFC, SPC and CSC Control Form – Common to All Projects

MFC, SPC and CSC Control Form - Common for All projects

Data Forms Administration Reports User Details

Culture Initiation Module

Cell Suspension Culture Module

Banana Project Selection Form

Exit

This form contains launch buttons for data forms and reports common to all projects.

3.4.1 Data Form

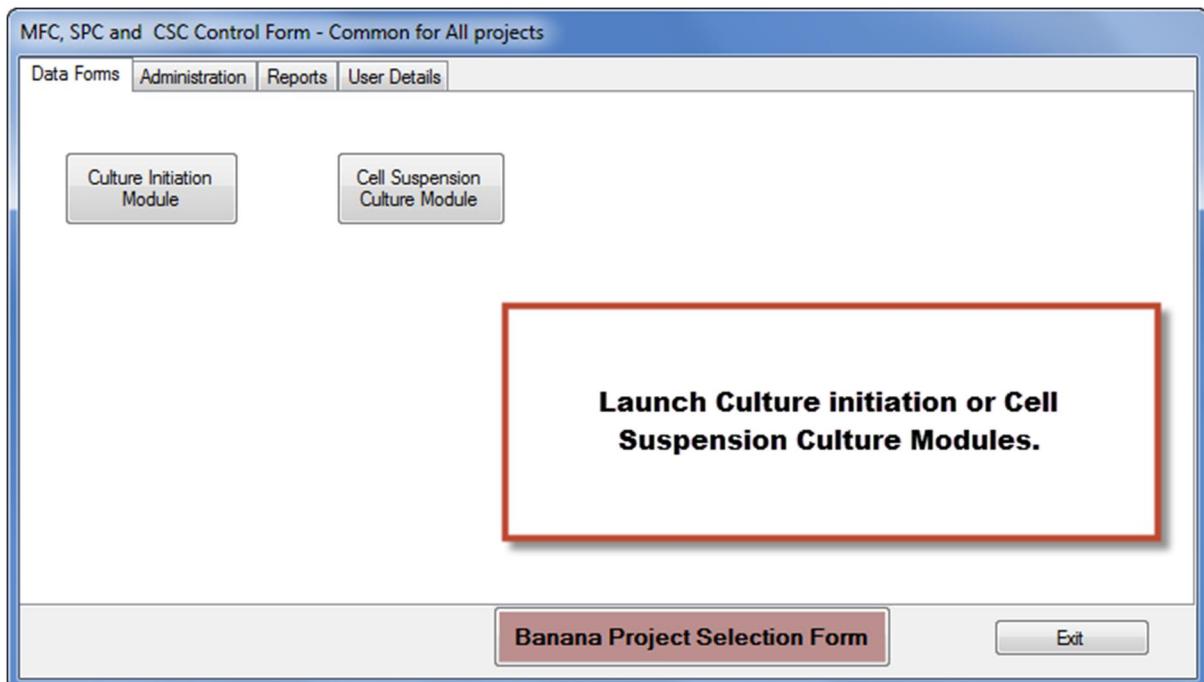
MFC, SPC and CSC Control Form - Common for All projects

Data Forms Administration Reports User Details

Culture Initiation Module Cell Suspension Culture Module

Launch Culture initiation or Cell Suspension Culture Modules.

Banana Project Selection Form Exit



3.4.2 Administration

MFC, SPC and CSC Control Form - Common for All projects

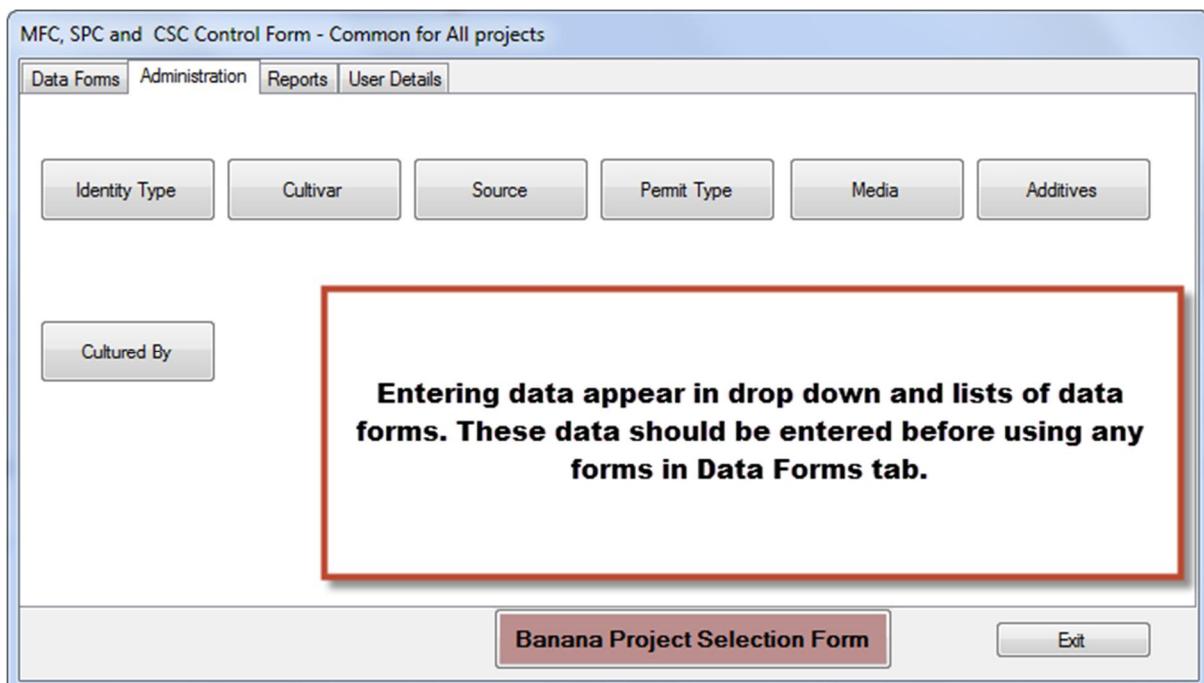
Data Forms Administration Reports User Details

Identity Type Cultivar Source Permit Type Media Additives

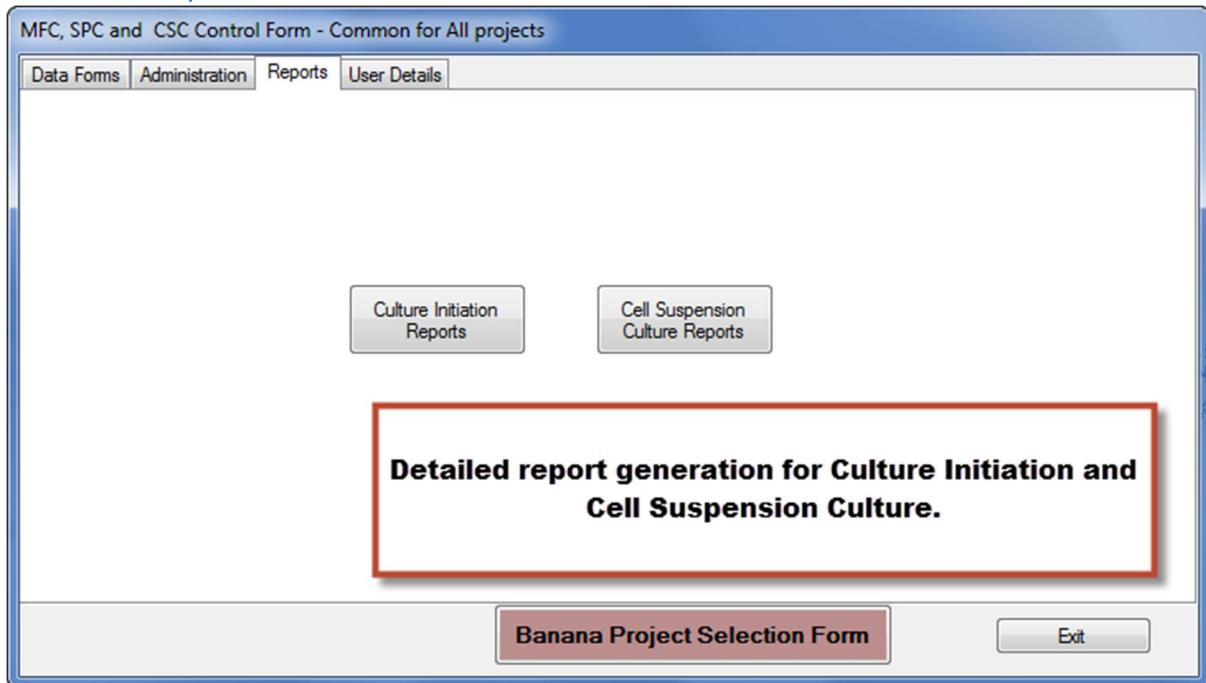
Cultured By

Entering data appear in drop down and lists of data forms. These data should be entered before using any forms in Data Forms tab.

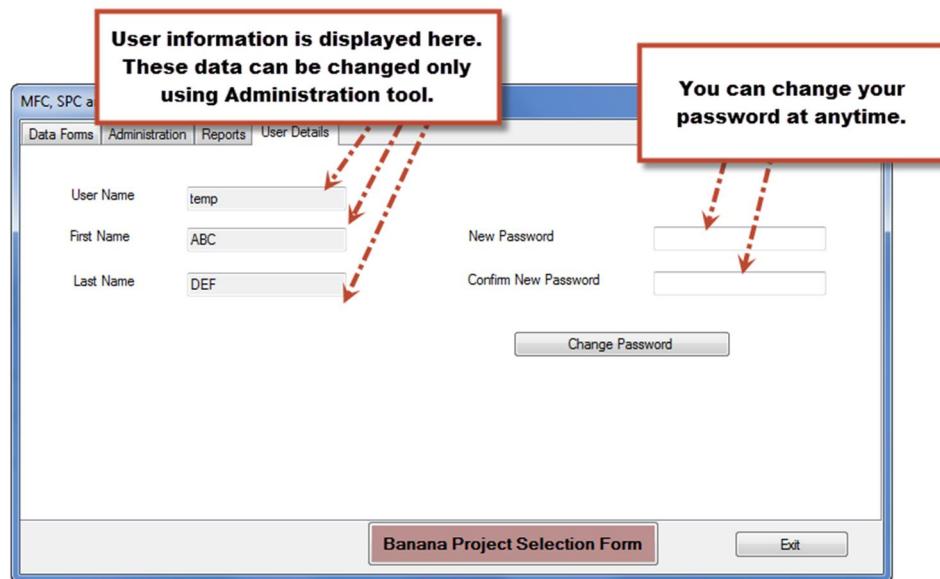
Banana Project Selection Form Exit



3.4.3 Reports



3.4.4 User Details



IMPORTANT

When you try to update data in any form in Banana Tracker, if you see 1 January 1980 or 1 January 1900 in any Date data field that means data has not been entered to that particular field before.

This was done to handle certain issues in the Calender control.

3.5 Using Forms in the Administration tab of the Control Form – Common to all projects

The process shown below can be followed for all the forms in the Administration tab of the Control Form – Common to all projects and all the forms in the Administration tab of the Control Form – specific to each project except the DIR License (Field Trial Licence).

In all these forms deleting is disabled. You can update existing data. **Data in these forms should be thoroughly checked for spelling or formatting errors before using in data forms.** Otherwise the same mistake will propagate in the records which uses that.

3.5.1 Add a new Record

Enter the information for the new data member. Description is optional.

Cultivar	Description
Bluggoe	
Dwarf Cavendish	
Gold Finger	
Gros Michel	
Lady finger	
Williams	

New Cultivar: the description for new cultivar:

Add New Identity Type

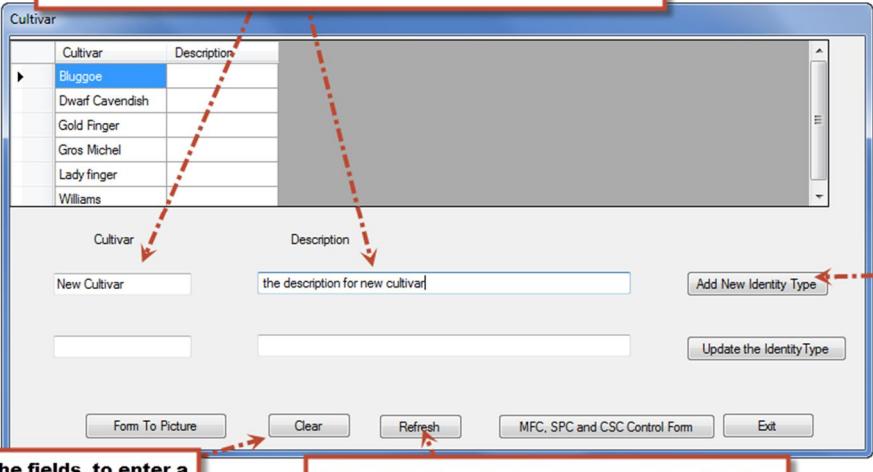
Update the IdentityType

Form To Picture Clear Refresh MFC, SPC and CSC Control Form Exit

Press the button to add the new record.

Clear the fields. to enter a new record.

Refresh to view the newly added record in the table view..



3.5.2 Update an existing Record

Click on the record you want to update. It will appear on the text box as indicated.

Cultivar	Description
Bluggoe	
Dwarf Cavendish	
Gold Finger	
Gros Michel	
Lady finger	
Williams	

Cultivar: Description:

Add New Identity Type

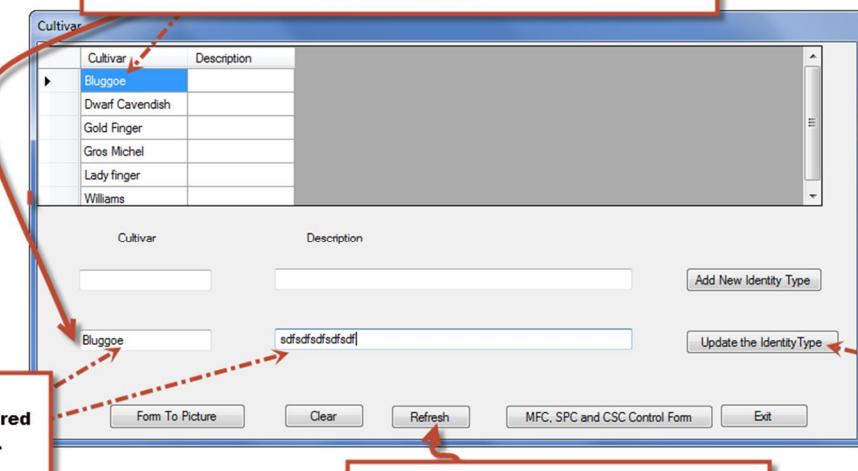
Update the IdentityType

Form To Picture Clear Refresh MFC, SPC and CSC Control Form Exit

Do the required changes.

Press this button to update.

Refresh to view the effect.



3.6 Culture Initiation Form

All the Underlined fields are compulsory to enter.

Same pattern of data entry is followed in Cell Suspension Culture, Transformation and Plant Tissue Culture Forms.

3.6.1 Entering a new record (Without Subculturing – Subculturing for the generated ID can be done later.)

The screenshot shows the 'Culture Initiation' form with several fields highlighted:

- 1. Select the "New Culture Initiation" Tab**: Points to the 'New Culture Initiation' tab at the top.
- 2. Select the year. By default current year is selected.**: Points to the 'Year' dropdown set to '2013'.
- 3. Select the culture type and press "Generate Identity"**: Points to the 'Culture Type' dropdown set to 'Male Flower Culture (MFC)' and the 'Generate Identity' button.
- 4. A unique Identity number and identity type is generated.**: Points to the 'Explant Identity' field showing 'MFC1300032'.
- Select from lists**: Points to the 'Cultivar' dropdown set to 'Bluggoe'.
- fill if virus indexing is "Yes"**: Points to the 'Virus Indexed' dropdown set to 'Yes'.
- Multiple selections are possible.**: Points to the 'Additives' dropdown which lists multiple items like AntiOx, GA3, IAA100, etc., with checkboxes.
- Press to Save the record.**: Points to the 'Save Starter Culture' button.
- Clear the form to enter a new record.**: Points to the 'Clear the Form' button.
- Proceed without immediate subculturing.**: Points to the 'Ready to Culture?' button set to 'No'.

Please select the correct year before pressing "Generate Identity" Button. If any mistake happens, clear the form and start again.

For Experiments done before 31-JULY- 2016, Lab book number and Page number are optional in all modules.

3.6.2 Entering a new record (With Subculturing and label generation.)

The screenshot shows the 'Culture Initiation' software interface. A red box labeled '1. Press "Yes" for subculturing.' points to the 'Ready to Culture?' button. Another red box labeled '2. These fields will appear. Fill the information.' points to the right side of the screen where 'Date of Culture', 'Cultured By', and 'Comments' fields are visible. A third red box labeled '3. Press the save button.' points to the 'Save Starter Culture and Sub Culture' button. A fourth red box labeled '4. Select the Required fields for generating labels and press "Export to Excel".' points to the 'Export to Excel' button and the list of exportable fields.

Culture Initiation

Search Culture Initiation | New Culture Initiation | Updating Last Subculture |

Culture Type: Male Flower Culture (MFC) | **Explant Identity:** MFC1300032 | **Generate Identity:** | **Year:** 2013

Cultivar: Bluggoe | **Cultivar Confirmed:** Yes | **Source:** New South Wales | **Virus Indexed:** Yes | **Permit Type:** ATO | **Permit Number:** 566 | **Date of Initial Culture:** Friday, 13 September 2013 | **Media:** M4

Additives: AntiOx, GA3, IAA100, Kan100, Kan50, STS, Tim200, Tim300

Lab Book Number: 44 | **Page Number:** 55 | **Ready to Culture?**: Yes | **Comments:** dhfhdfgh

Number of Cultures: 10 | **Date of Culture:** Friday, 13 September 2013 | **Cultured By:** becker | **Comments:** fgdfgsdfg

Virus Indexed Date: Friday, 13 September 2013 | **Virus Indexed By:** ghaffifa

Select the Fields Required to be Exported to Excel:

- main_ExplantIdentity
- main_ExplantIdentityType
- main_Cultivar
- main_Source
- main_DateOfStarterCulture
- main_Media
- main_Additives
- main_LabBookNumber
- main_PageNumber
- sub_NumberOfCultures
- sub_DateOfCulture
- sub_CulturedBy

Export to Excel

Explant Identity: | **Load Data:** | **Update:**

Clear the Form

Form To Picture | **MFC, SPC and CSC Control Form** | **Exit**

After pressing "Export to Excel" wait for 2-3 seconds. Excel file will be saved on your desktop.

The screenshot shows an Excel spreadsheet with the following data:

	A1	B1	C1	D1	E1	F1	G1	H1	I1	J1	K1
	ExplantIdentity	ExplantIdentityType	Cultivar	Source	Media	Additives	LabBookNumber	PageNumber	DateOfCulture	CulturedBy	
1	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
2	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
3	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
4	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
5	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
6	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
7	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
8	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
9	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
10	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
11	MFC1300032	MFC	Bluggoe	New South Wales	M4	AntiOx IAA100 Kan50 Tim200 Tim300	44	55	13/09/2013 12:00:00 AM	becker	
12											
13											
14											
15											
16											

3.6.3 Process for Searching and Sub- Culturing.

1. Select the "Search Culture Initiation" Tab

2. Provide the Search Condition.

3. Press "Search"

Always clear the form before starting a new search.

Select an ID and press "Culture" for entering sub-culturing information.

The subculturing history of the selected ID will appear.

Use to delete the selected ID record and its sub-culture history.

select this for performing search on deleted records.

4. Enter the information and press save for label generation

5. Generate the labels.

ExplantIdentity	ExplantIdentityType	Cultivar	CultivarConfirmed	CultivarConfirmedC	Source	VirusIndexed
MFC0950001	MFC	Bluggoe	Yes		New South Wales	No
MFC1100001	MFC	Bluggoe	Yes		New South Wales	Yes
MFC1100006	MFC	Gros Michel	No		New South Wales	No
MFC1100009	MFC	Dwarf Cavendish	No		New South Wales	Yes
MFC1100010	MFC	Dwarf Cavendish	Yes		New South Wales	Yes
MFC1100014	MFC	Williams	No		New South Wales	Yes
MFC1100017	MFC	Dwarf Cavendish	Yes		New South Wales	No

ExplantIdentity	NumberOfCultures	DateOfCulture	CulturedBy
MFC1100001	5	5/05/2011	becker
MFC1100001	5	25/03/2012	middleton
MFC1100001	4	16/05/2012	becker

Selected Identity: MFC1100001
Number of Cultures: 23
Date of Culture: Friday , 13 September 2013
Cultured By: becker
Media: BL
Lab Book Number: 33
Page Number: 44
Comments: fdgds

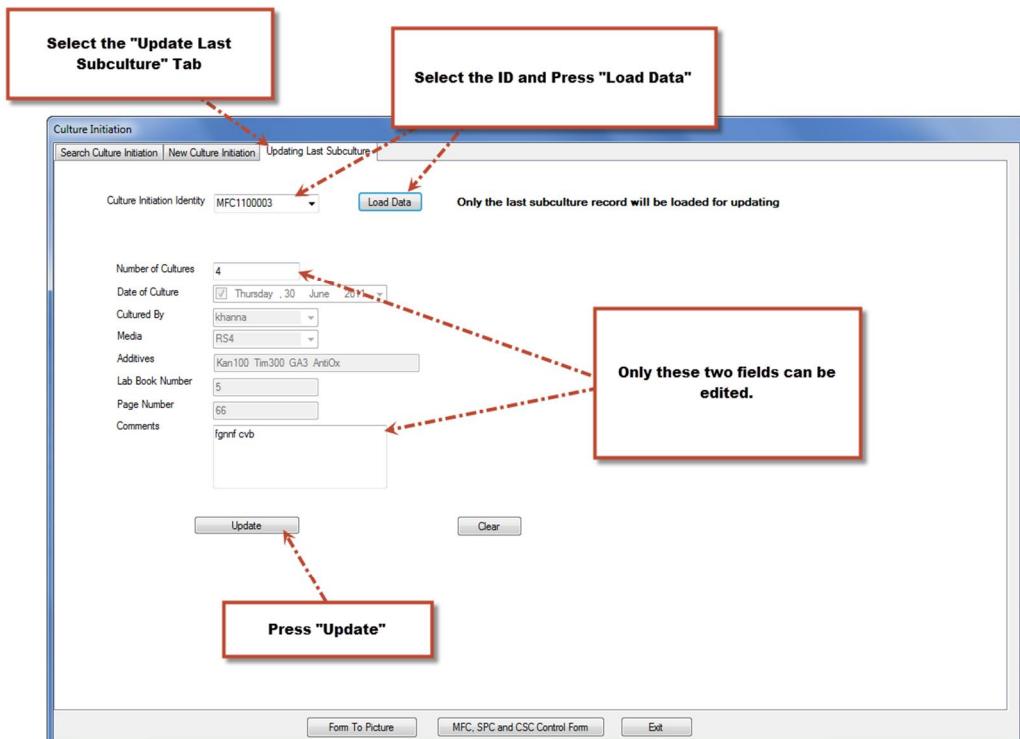
Additives:
 AntOx
 GA3
 IAA100
 Kan100
 Kan50
 STS
 Tim200
 Tim300

Select the Fields:
 main_ExplantIdentity
 main_ExplantIdentityType
 main_Cultivar
 main_Source
 main_DateOfStarterCulture
 main_Media
 main_Additives
 main_LabBookNumber
 main_PageNumber
 sub_ExplantIdentity
 sub_ExplantIdentityType
 sub_Cultivar
 sub_CulturedBy
 sub_MediaForCultures
 sub_AdditivesForCultures
 sub_LabBookNumberForCultures
 sub_PageNumberForCultures

Export to Excel

Identical Search process is followed in Cell Suspension culture, Transformations and Plant Tissue Culture.

3.6.4 Process for updating the last subculture



Identical Last Sub Culture Update process is followed in Cell Suspension culture, Transformations and Plant Tissue Culture.

3.6.5 Updating the "Virus Indexing" information at a later stage

Virus Indexing is not done for this ID.

4. You can Change the Virus Indexing information. Only Virus indexing related data can be changed.

1. Press the "Refresh" button

2. From the list, select the ID you want to enter Virus indexing information.

3. press "Load" to retrieve the information

5. Press "Update" to save the Changes.

This feature is provided since the virus indexing for a Male Flower culture can be done at later stage.

3.7 Cell Suspension Culture

1. Select the Parent ID and Press "Get Data"

2. Press "Generate Identity"

Data from Parent ID

Remaining process is same as Culture Initiation.

Please select the correct year before pressing "Generate Identity" Button. If any mistake happens, clear the form and start again.

3.8 Culture Initiation Reports

1. Select one or more Conditions

2. Select the fields for the report. sub prefix indicates the fields in the subculture records

3. Load the Data

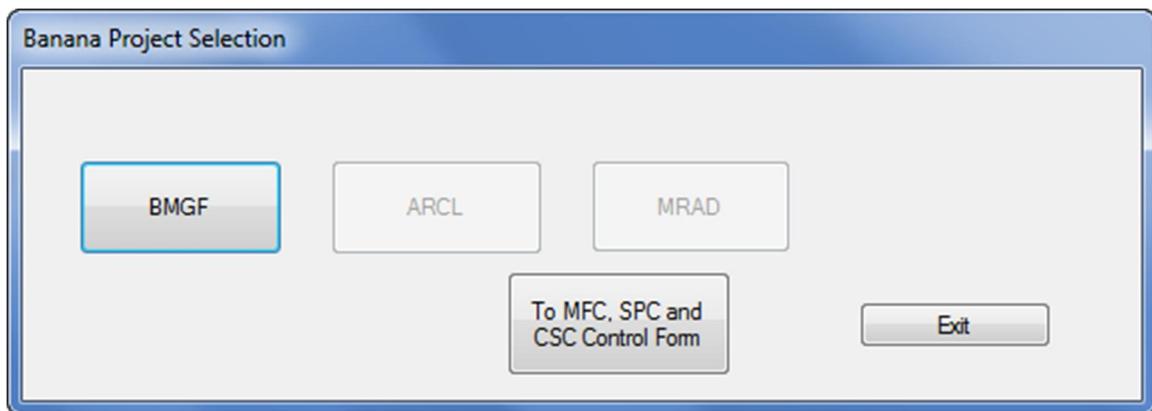
4. Create the excel file and save on desktop.

ExplantIdentity	ExplantIdentityType	Cultivar	Source	DateOfStarterCultur	Media	Additives	LabBookNumber	Page
MFC1100001	MFC	Bluggoe	New South Wales	1/05/2011	M3	IAA100 Kan50 ...	34	55
MFC1100001	MFC	Bluggoe	New South Wales	1/05/2011	M3	IAA100 Kan50 ...	34	55
MFC1100001	MFC	Bluggoe	New South Wales	1/05/2011	M3	IAA100 Kan50 ...	34	55
MFC1100001	MFC	Bluggoe	New South Wales	1/05/2011	M3	IAA100 Kan50 ...	34	55
MFC1300032	MFC	Bluggoe	New South Wales	13/09/2013	M4	AntiOx IAA100 ...	44	55

Identical Report Generation process is followed in Cell Suspension culture, Transformations, Plant Tissue Culture and New Plant in Plant Tissue Culture.

Forms Specific for Each Project

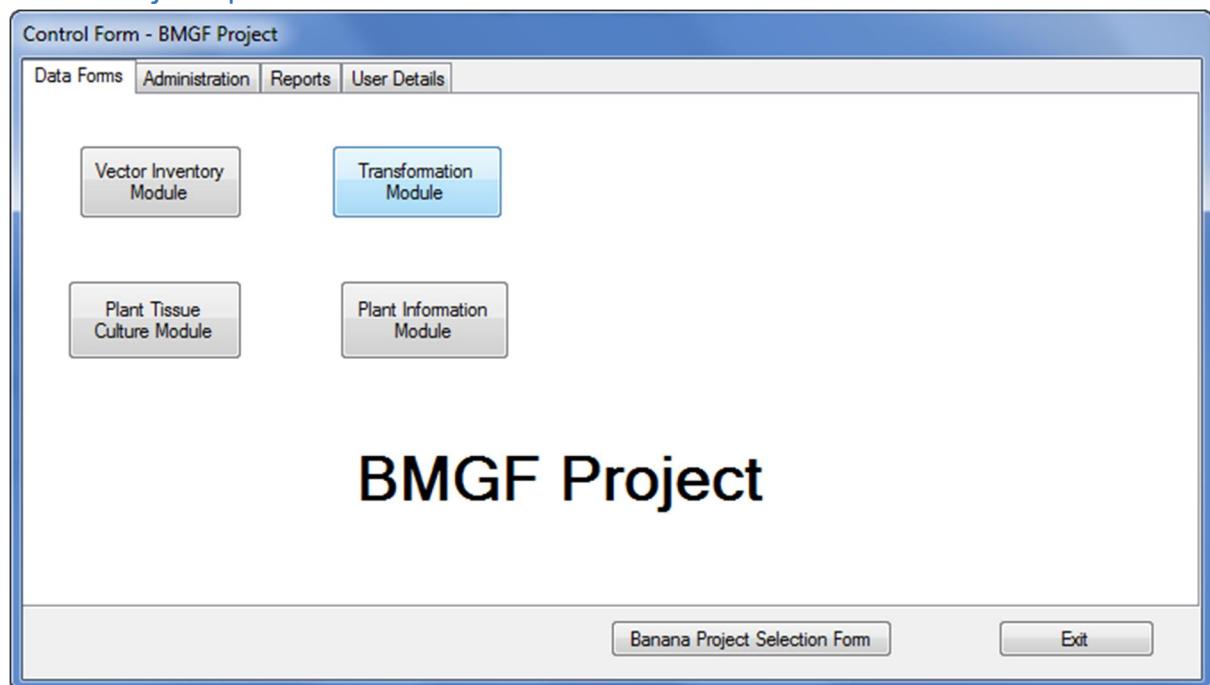
3.9 Banana Project Selection Form



Select the Project you are working on.

Only the projects assigned to a staff member can be accessed.

3.10 Project Specific Control Form



Control Form Structure is similar to the common control form structure. Forms and reports in this control form are specific to each project.

3.11 Vector inventory Module

3.11.1 Add new record

A compulsory field to enter.

These values are automatically generated once the record is saved.

This is generated based on the project.

Enter the relevant data

Vector Inventory Module - BMGF Project

Vector Inventory 1 | Vector Inventory 2 | Vector Inventory 3 | Search

Vector ID: pBMGF-RTF23-15 | Clear All the Tabs

Vector Prefix: BMGF | Vector Code: RTF23 | Vector Suffix: 15 | Bacterial Selection: Amp

Plant Selection: Amp | Synonyms: 1 rtf23 | 2 | 3 | 4 | 5

Features Backbone: pCam

Cassette 1	Cassette 2	Cassette 3	Cassette 4	Cassette 5
Promoter: ACO	Promoter:	Promoter:	Promoter:	Promoter:
Gene: APsy2a	Gene:	Gene:	Gene:	Gene:
Terminator: Nos	Terminator:	Terminator:	Terminator:	Terminator:
Add Feature: 5'UTR	Add Feature:	Add Feature:	Add Feature:	Add Feature:
sdfds				
Add Feature:	Add Feature:	Add Feature:	Add Feature:	Add Feature:
Add Feature:	Add Feature:	Add Feature:	Add Feature:	Add Feature:
Add Feature:	Add Feature:	Add Feature:	Add Feature:	Add Feature:

VNTI Map: Locate: \Documents\ZTE Router.txt

Cloned By: middleton | Date of Cloning: Friday, 13 September 2013

Lab Book Number: 0 | Page Number: 0 | Clear

Form To Picture | Control Form | Exit

Enter the relevant data

Vector Inventory Module - BMGF Project

Vector Inventory 1 | Vector Inventory 2 | Vector Inventory 3 | Search

PCR Screening Primers

	Name	Code	Sequence
Cassette 1	Forward		
	Reverse		
Cassette 2	Forward		
	Reverse		
Cassette 3	Forward		
	Reverse		
Cassette 4	Forward		
	Reverse		
Cassette 5	Forward		
	Reverse		

Sequencing Primers: Locate

Sequencing Completed: | Date of Sequencing: Friday, 13 September 2013 | Lab Book Number: 0 | Page Number: 0

Contig Express Sequencing Alignment: Locate | Sequencing Files: Locate

Checked By: | Date: Friday, 13 September 2013 | Verified By: | Date: Friday, 13 September 2013

Transformed Into Agro: | Strain: | Confirmed By PCR: | Date: Friday, 13 September 2013 | Clear

Form To Picture | Control Form | Exit

Vector Inventory Module - BMGF Project

Vector Inventory 1 | Vector Inventory 2 | Vector Inventory 3 | Search

DNA Storage Location	E.coli Glycerol Storage Location	Agro Glycerol Storage Location
DNA Storage Box	E.coli Glycerol Storage Box	Agro Glycerol Storage Box
Stored By	Stored By	Stored By
Date	Friday , 13 September 2013	Date
	Friday , 13 September 2013	Date
	Friday , 13 September 2013	

Enter the relevant data.

Clear

Clear All three forms

Save the Plant Expression Vector Record

Form To Picture | Control Form | Exit

3.12.2 Update a record

Provide a condition for searching

Vector Inventory Module - BMGF Project

Vector Inventory 1 | Vector Inventory 2 | Vector Inventory 3 | Search

VectorID	Synonym	Promoter	Gene	Terminator	Backbone	Used By
VectorID	ACO					
Date of Cloning From	Friday , 13 September 2013	Clear The Form Before Every New Search				Search
To	Friday , 13 September 2013					Clear Form

Select a record

Press "Search"

Selected Vector ID

Load Data To View

Load Data To Update

Press this button if you just want to view the data. Data will be loaded into the first three forms.

Press this for loading data to update the record. Data will be loaded to the first three forms. Make the changes and press the "Update" button in "Vector Inventory 3" Tab.

Form To Picture | Control Form | Exit

3.12 Transformation Module

Select appropriate data

Select the parent ID CSC, MFC or SPC

Press this button if vectors are used.

Transformation Type: Biolistic

Agrobacterium Strains: AGLI

Parent ID Type: Cell Suspension Cult.

Parent ID: CSC0660001

Get Data

Press Get Data

Number of Cultures: 45

Date of Culture: Friday, 13 September 2013

Cultured By: khanna

Comments: gfhg

Save Starter Culture and Sub Culture

Transformation ID: BMGF1304020

Identity Type: TPC

Cultivar: Gold Finger

Permit Type: AQIS

Permit Number: 6544

IPC/UPC Initial Culture Date: Friday, 13 September 2013

Media: MS

Additives:

- AntiOx
- GA3
- IAA100
- Kan100
- Kan50
- STS
- Tim200
- Tim300

Lab Book Number: 78

Page Number: 32

Ready to Culture? Yes

Clear the Form

Select the Fields Required to be Exported to Excel

- main.TransformationID
- main.IdentityType
- main.DateOfStarterCulture
- main.Media
- main.Additives
- main.Cultivar
- main.PageNumber
- sub.NumberOfCultures
- sub.DateOfCulture
- sub.CulturedBy

Export to Excel

Form To Picture

Control Form

Exit

Remaining steps are similar to Culture Initiation.

3.13 Plant Tissue Culture Module

3.13.1 Add new PTC record

Select the Source type

If source Plant is New then this form must be filled.

Select the Source ID and press the button to load the data.

Generate the ID

Remaining Steps are same as Culture Initiation.

Search Plant Tissue Culture | Updating Last Subculture | New Plant Tissue Culture | Plant Tissue Culture Deployment | TMPL/UMPL | TGPL/UGPL | TFPL/UFPL | Batch Subculturing Module

Source

TPC ID: BMGF1104003 UPC ID:

Vector ID: CTCB-BMG-pDCG

Promoter: ACS Exp4

Gene: Ctrl Ctrl

Virus Indexed: Yes

Year: 2013

PTC Identity: BMGF1306024

Identity Type: TPL

TPL/UPL_Initial Culture Date: Friday, 13 September 2013

Media: M4

Additives: AntiOx, GA3, IAA100, Kan100, Kan50, STS, Tim200, Tim300

Lab Book Number: 44

Page Number: 66

Ready to Culture?:

Select the Fields Required to be Exported to Excel

main.PTCIdentity
 main.IdentityType
 main.DateOfStarterCulture
 sub.NumberOfCultures
 sub.DateOfCulture
 sub.CulturedBy
 sub.MediaForCultures
 sub.AdditivesForCultures
 sub.LabBookNumberForCultures
 sub.PageNumberForCultures

Export to Excel

Number of Cultures: 55

Date of Culture: Friday, 13 September 2013

Cultured By: khanna

Comments: ghdghfd

Save Starter Culture and Sub Culture

Form To Picture | Control Form | Exit

3.13.2 Plant Tissue Culture Deployment Form

Press this button first.

Select TPL or UPL and press the relevant button.

Enter the number of plants under each category.

Select TPL or UPL and press the relevant button.

Press the generate buttons. Unique IDs are generated.

Save the Records.

Save Deployment Identities

Deployment Type	Number	Action
TPL	5	Generate Identities
TPL	6	Generate Identities
TPL	2	Generate Identities
UPL	UMPL	Generate Identities
UPL	UGPL	Generate Identities
UPL	UFPL	Generate Identities

The Records Have Been Saved Successfully

OK

3.13.3 TMPL/UMPL

3.13.3.1 Entering a new record

The screenshot shows a software interface for entering a new TMPL/UMPL record. The window title is "TMPL/UMPL". The interface includes tabs for "Search Plant Tissue Culture", "Updating Last Subculture", "New Plant Tissue Culture", "Plant Tissue Culture Deployment", "TMPL/UMPL", "TGPL/UGPL", "TFPL/UFPL", and "Batch Subculturing Module".

1. Refresh the form: Points to the "Refresh" button.

2. Select the PTC ID: Points to the "Plant Tissue Culture Identity" dropdown menu, which contains "BMGF1106001".

3. Pres the button to view relevant TMPL/UMPL IDs: Points to the "View Data" button next to the PTC ID dropdown.

4. Enter these data.: Points to the "Deployment Location" dropdown set to "Field: NQLD" and the "Deployment Date" dropdown set to "Saturday, 14 September 2013". It also points to the "Save" button at the top right of the main area.

5. Save the record.: Points to the "Save" button located below the deployment details and above the trash confirmation section.

The form also includes sections for "Redeployment to TGPL/UGPL or TFPL/UFPL" (with checkboxes for "TGPL/UGPL" and "TFPL/UFPL"), "Deploy to TGPL/UGPL" and "Deploy to TFPL/UFPL" buttons, and a "Subculture" section with a "Generate Identities" button. At the bottom, there is a "Do you want to Trash the TMPL/UMPL?" section with "Yes" and "No" checkboxes, a "Comments" text area, a "Trash" button, and buttons for "Form To Picture", "Control Form", and "Exit".

Process is similar for TGPL/UGPL new record Entry.

3.13.3.2 Subculturing

The screenshot shows the 'Subculture' section of a software application. The interface includes fields for 'Plant Tissue Culture Identity' (BMGF1106001), 'TMPL/UMPL Deployment Identity' (BMGF1106001-25-TMPL), 'Deployment Location', 'Deployment Date' (Saturday, 14 Sep), and buttons for 'Save', 'Deploy to TGPL/UGPL', and 'Deploy to TFPL/UFPL'. A 'Comments' section with a 'Trash' button is also present. On the right, a 'Subculture' panel shows 'Number of Cultures' set to 10, a list of generated IDs (BMGF1106001-52-TMPL, etc.), and a 'Generate Identities' button. At the bottom are buttons for 'Form To Picture', 'Control Form', and 'Exit'. Red boxes and arrows highlight the following steps:

- 1. Refresh the form**
- 2. Select the PTC ID**
- 3. Press the button**
- 4. Select the ID using for Sub Culturing**
- 5. Enter the Number of subcultures.**
- 6. Press to generate unique IDs for each sub**
- 7. Save the records.**

A red circle highlights the 'Clear Form' button at the bottom left of the main area, with a red box containing the text: **Clear the form before each new activity.**

This process is similar for TFPL/UFPL multiply feature.

3.13.3.3 Redeployment

1. Refresh the form

2. Select PTC ID

3. Press the button

4. Select the TMPL/UMPL ID you want to redeploy as TGPL/UGPL or TFPL/UFPL

5. Select the relevant redeployment type

6. Press for redeployment.

The screenshot shows a software window titled 'Plant Tissue Culture Deployment'. At the top, there are several tabs: 'Search Plant Tissue Culture', 'Updating Last Subculture', 'New Plant Tissue Culture', 'Plant Tissue Culture Deployment' (which is selected), 'TMPL/UMPL', 'TGPL/UGPL', 'TFPL/UFPL', and 'Batch Subculturing Module'. Below the tabs, there's a toolbar with buttons for 'Refresh', 'Save', and 'Trash'. The main area is divided into sections:

- Subculture:** Contains fields for 'Number of Cultures' (with a 'Generate Identities' button) and a 'Save' button.
- Deployment Identity:** Shows 'Plant Tissue Culture Identity' (BMGF1106001) and 'TMPL/UMPL Deployment Identity' (BMGF1106001-25-TMPL). A 'View Data' button is next to the TMPL/UMPL field.
- Redeployment Options:** A section titled 'Redeployment to TGPL/UGPL or TFPL/UFPL' contains two checkboxes: 'TGPL/UGPL' (checked) and 'TFPL/UFPL'. Below these are buttons for 'Deploy to TGPL/UGPL' and 'Deploy to TFPL/UFPL'.
- Trash Options:** A section asking 'Do you want to Trash the TMPL/UMPL?' with a 'Yes' checkbox. It includes a date selector ('Saturday, 14 September 2013') and a 'Comments' text area. A 'Trash' button is at the bottom.

At the bottom of the window are buttons for 'Form To Picture', 'Control Form', and 'Exit'.

3.13.3.4 Trashing Records

The screenshot shows the 'Subculture' section of the TMPL/UMPL record entry form. Several red boxes and arrows highlight specific steps:

- 1. Enable the Trash option.** A red box points to the 'Do you want to Trash the TMPL/UMPL?' checkbox area.
- 2. All available TMPL/UMPL IDs will be displayed here. Select the ID you want to delete.** A red box points to the 'TMPL/UMPL Deployment Identity' dropdown menu, which lists 'BMGF1106001-14-TMPL'.
- 3. Press this if you want view the data related to the ID** A red box points to the 'View Data' button next to the deployment ID dropdown.
- 4. Enter these data.** A red box points to the 'Comments' text input field containing 'sfds'.
- 5. Press Trash** A red box points to the 'Trash' button at the bottom of the form.
- 6. Confirm** A red box points to a 'Record Deletion' confirmation dialog box.

The 'Record Deletion' dialog box contains the message: 'You are about to delete a Data record and related records. Do you really want to DELETE the Record?' with 'Yes' and 'No' buttons.

This process is similar for TGPL/UGPL and TFPL/UFPL

3.13.4 TGPL/UGPL

TGPL/UGPL new record entry and trashing is similar to TMPL/UMPL. Sections 3.14.3.1 and 3.14.3.4

3.13.5 TFPL/UFPL

3.13.5.1 Entering a new record

Unsuccessful Validation

1. Refresh the form

2. Select the PTC ID

3. Press to populate the list below.

4. Select the ID for Field Deployment

5. Select to get the Virus Indexing status. This should be "Yes" to proceed.

6. Enter these data

7. Enter these data.

8. Press "Validate"

If validation is not successful then ID generation is disabled.

9. Validation status. If unsuccessful then the reason also is displayed.

The License validation step is not available for IITA version.

If require, licence validation can be implemented in future.

Successful Validation

The screenshot shows a software interface for plant tissue culture management. At the top, there are tabs: Search Plant Tissue Culture, Updating Last Subculture, New Plant Tissue Culture, Plant Tissue Culture Deployment, TMPL/UMPL, TGPL/UGPL, TFPL/UFPL, and Batch Subculturing Module. The TFPL/UFPL tab is active.

On the left, there's a search panel with fields for Plant Tissue Culture Identity (BMGF1106001), TFPL/UFPL Deployment Identity (BMGF1106001-33-TFPL), and a 'View Data' button. Below it is a 'Retrieve Virus Indexing Information' section with a 'Virus Indexed Explant' dropdown set to 'Yes'.

The main form contains several dropdown menus and input fields:

- Virus Indexed Plant: Yes (selected)
- IF "Yes" -> Virus Indexed Date: Saturday, 14 September 2013
- Virus Indexed By: fsfs
- Lab Book Number: 4
- Page Number: 55
- Deployment Location: Field: Darwin
- Deployment Date: Saturday, 14 September 2013
- Field Trial Identity: FT2-P2
- Deployment Reason: fdsgdfg
- Permit Type: ATO
- Permit Number: 444
- Field Trial License Type: DIR
- Field Trial License Number: 737373

Below the main form, there's a 'Validate' button and a 'Generate Field Trial Plant ID' button. The generated ID is FT12018. To the right, there's a 'Multiply' section with a 'Number of Plants' field and a 'Generate Identities' button. A red box highlights the 'Generate the FT ID.' button. A red dashed arrow points from the 'Generate the FT ID.' button to the 'Generate Field Trial Plant ID' button. Another red dashed arrow points from the 'Generate Field Trial Plant ID' button to the generated ID FT12018. A third red dashed arrow points from the generated ID FT12018 to the 'Save' button. A fourth red dashed arrow points from the 'Save' button to the 'DIR License Validation Successful' message. A callout box states: "When the license validation is successful then the ID generation is enabled."

A red box also highlights the message: "A unique Field deployment ID is generated. DIR (Field Trial) License information is automatically updated after saving the record."

3.13.5.2 Multiplying

Similar to the TMPL/UMPL Subculturing process.

3.13.5.3 Trashing

Similar to the TMPL/UMPL Trashing process.

3.13.6 Batch Subculturing

Select the date range and press search.

Select	Number of Cultures	PTCIdentity	VectorID1	VectorID2	IdentityType	DateOfStarterCult
<input checked="" type="checkbox"/>	10	BMGF0480001	CTCB-BMG-pDCG		TPL	18/03/2012
<input type="checkbox"/>	12	BMGF0880001			UPL	18/03/2012
<input type="checkbox"/>	14	BMGF1106012	CTCB-BMG-pDOG		TPL	17/01/2012
<input type="checkbox"/>	14	BMGF1106013			UPL	17/01/2012
<input type="checkbox"/>	15	BMGF1106015	CTCB-BMG-pDOG		TPL	17/01/2012
<input type="checkbox"/>	16	BMGF1106016			UPL	17/01/2012
<input checked="" type="checkbox"/>	13	BMGF1206019			UPL	7/05/2012
<input type="checkbox"/>		BMGF1206020			UPL	12/05/2012
<input type="checkbox"/>		BMGF1206021			UPL	12/05/2012

Select the IDs for Batch Subculturing.

Enter the number of subcultures.

Enter these data

Date of Culture: Saturday, 14 September 2013
 Cultured By: becker
 Media: M4
 Lab Book Number: 44
 Page Number: 5b
 Comments: sdgsafdg

Additives: AntiOx, GA3, IAA100, Kan100, Kan50, STS, Tim200, Tim300

Save

Export to Excel for Label generation

3.14 Plant Information Module

Before entering Plant Information under any plant, you must first generate a Sample ID. Sample ID generation is done in the first tab (General Plant Data) of Plant Information form. Sample ID generated should be used for entering data in other tabs.

3.14.1 General Plant Data – Creating a new Record

Creating a new Sample ID using a FT number generated through Banana Tracker.

The screenshot shows the 'Plant Information' module with the 'General Plant Data' tab selected. A 'Field Trial Plant ID' dropdown is set to 'FT12003'. A red arrow points from this field to a callout box labeled 'List of available FT IDs'. Another red arrow points from the same field to a callout box labeled 'Press to get the related information'. A third red arrow points from the same field to a callout box labeled 'If there is an ID used before, enter it here.' A fourth red arrow points from the same field to a callout box labeled 'Updating'. A fifth red arrow points from the 'Sample ID' field to a callout box labeled 'Press to enable the remaining fields.' A sixth red arrow points from the 'Generate Sample ID' button to a callout box labeled 'Generate the Sample ID'. A seventh red arrow points from the 'Save' button to a callout box labeled 'Save the Record'.

Before entering Proximate Analysis, Biofortification, Reporter Gene or Disease resistance data, first create a sample ID in General Plant Data. Sample ID created will appear in all Proximate Analysis, Biofortification, Reporter Gene and Disease resistance data forms.

Before entering data in other forms please press the CLEAR button in the form to REFRESH FT ID list

3.14.2 Update Records

(Updating Process is Same in all the other forms)

Plant Information

General Plant Data | Proximate Analysis | Biofortification Data | Reporter Gene Data | Disease Resistance Data - Field | Disease Resistance Data - Glasshouse

Field Trial Plant ID: FT1002 | Old Field Trial Plant ID: | Sample Plant ID: BMG69870 | Vector ID: Temp1 | Temp 2 | Promoter: P1 | P2 | Gene: G1 | G2 | Field Trial Identity: FT-09 | Crop Cycle: Plant Crop (PC) | Date of Planting: Tuesday , 1 January 1980 | Phenotype: | Date of Bunch Emergence: Tuesday , 1 January 1980 | Date of Finish Bunch Harvest: Tuesday , 1 January 1980 | Bunch Weight: 0.00 kg | Save | Clear

1) Press the button

2) Select the FT ID

3) Press to populate the list below.

4) Select the Sample ID

5) Press to populate the fields with old data.

6) Update the required content.

7) Save the Changes

Load and Update Data | Get Data | Update | Sample Collection | Type of Sample: LEAF | Stage of Fruit Sampling: | Date of Sampling: Sunday , 8 April 2012 | Generate Sample ID | Sample ID: FT1002-PC-LEAF-08Apr2012 | Form To Picture | Control Form | Exit

3.14.3 Proximate Analysis

(Same process for all the remaining forms)

Select the FT id

Press to retrieve the below information

Update Feature

Select the Sample ID.

Save the Record

Always press the clear button before entering a record to REFRESH the FT ID list

3.14.4 Biofortification Data

Control Samples under Field Trial Identity will be displayed here.

Select the Micronutrient and press the button to enable the relevant Panel.

3.14.5 Disease Resistance Data – Field

Plant Information

General Plant Data	Proximate Analysis	Biofortification Data	Reporter Gene Data	Disease Resistance Data - Field	Disease Resistance Data - Glasshouse
Disease Resistance Data - Field					
Field Trial Plant ID: FT1001 <input type="button" value=">"/> Sample Plant ID: BMGF66784444	<input type="button" value="Load and Update Data"/> Field Trial Plant ID: <input type="button" value=">"/> Sample ID: <input type="button" value="Get Data"/> <input type="button" value="Update"/>				
Vector ID: <input type="text"/> Promoter: <input type="text"/> Gene: <input type="text"/>					
Field Trial Identity					
Sample ID: FT1001-PC-ROOT-08Apr2012	Date of Data Collection 1: <input type="button" value="Sunday , 10 June 2012"/> External Symptom: <input type="text"/>				
Crop Cycle: <input type="text"/>	Date of Data Collection 2: <input type="button" value="Sunday , 10 June 2012"/> External Symptom: <input type="text"/>				
Date of Planting: <input type="button" value="Sunday , 10 June 2012"/>	Date of Data Collection: <input type="button" value="Sunday , 10 June 2012"/> External Symptom: <input type="text"/>				
Phenotype: <input type="text"/>	Final Score: <input type="text"/>				
Date of Bunch Emergence: <input type="button" value="Sunday , 10 June 2012"/>	Score of the Related Control in the Set: <input type="text"/>				
Date of Finish Bunch Harvest: <input type="button" value="Sunday , 10 June 2012"/>					
Bunch Weight: <input type="text"/> kg	Molecular Data File: <input type="button" value="Locate"/>				
Pathogen: <input type="text"/>	Photo: <input type="button" value="Locate"/>				
Race: <input type="text"/>					
VCG: <input type="text"/>					
<input type="button" value="Clear"/> <input type="button" value="Save"/>					
<input type="button" value="Form To Picture"/> <input type="button" value="Control Form"/> <input type="button" value="Exit"/>					

3.14.6 Disease Resistance Data – Glasshouse

Select the PTC ID

Select the Deployment ID

Generate the Sample ID.

Plant Information

- General Plant Data | Proximate Analysis | Biofertilization Data | Reporter Gene Data | Disease Resistance Data - Field | Disease Resistance Data - Glasshouse

Disease Resistance Data - Glasshouse

Plant Tissue Culture Identity: BMGF1106008

TGPL/UGPL Deployment Identity: BMGF1106008-3-TGPL

Vector ID: CTCB-BMG-pABC **CTCB-BMG-pDCG**

Promoter: ACS ACS ACO **ACS Exp4**

Gene: Ctrl DDXS Psy1Q60 **Ctrl Ctrl**

Glass House Trial ID: FT1-P1

Sample ID: BMGF1106008-3-TGPL-10Jun2012

Generate Sample ID

Pathogen

BBTV

Date of Inoculation: Sunday , 10 June 2012

Plant Size at the Time of Inoculation (cm)

Number of Aphids

Date of First Symptoms: Sunday , 10 June 2012

Date of Sample Collection: Sunday , 10 June 2012

Molecular Data File:

Photo:

Clear **Save**

Foc (Fusarium oxysporum f. sp. cubense)

Race: VCG

Date of Acclimation: Sunday , 10 June 2012

Date of Potting: Sunday , 10 June 2012

Date of Infection: Sunday , 10 June 2012

Date of Data Collection: Sunday , 10 June 2012

External Symptoms:

- Stem Splitting
- Yellowing and Wilting
- Final External Score
- Score of the Related Control in the Set

Internal Symptoms:

- Percent Com. Damage
- Percent Com. Damage in Control

Molecular Data File:

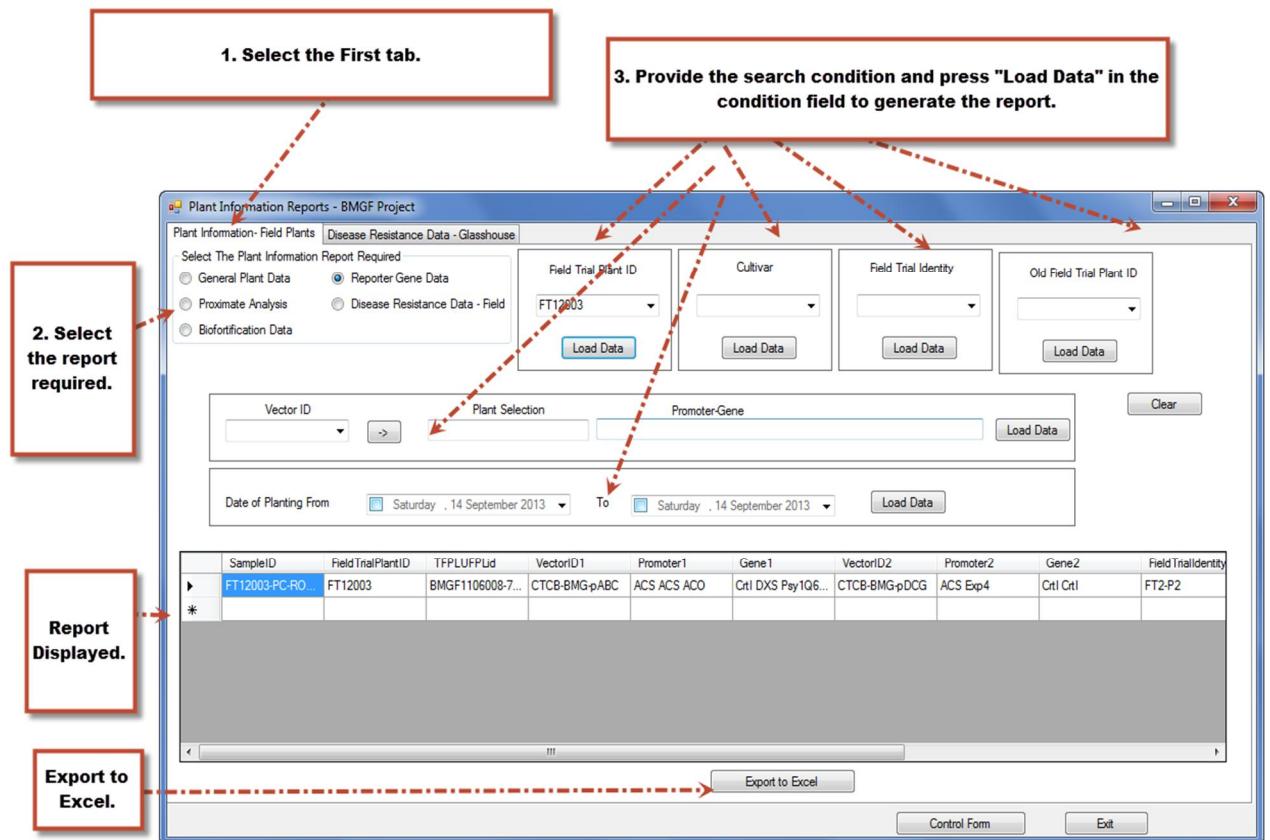
Photo:

Form To Picture **Control Form** **Exit**

3.15 Transformation, Plant Tissue Culture and New Plant in Plant Tissue Culture Reports.

Process is similar to Culture initiation Report generation in Section 3.8

3.16 Plant Information Reports – Field Plants



3.17 Plant Information Reports – Glasshouse Plants

Enter the Condition

Plant Information Reports - BMGF Project

Plant Information-Field Plants Disease Resistance Data - Glasshouse

Plant Tissue Culture Identity: BMGF1106003

Cultivar:

Glasshouse Trial ID:

Clear

Vector ID:

Plant Selection:

Promoter-Gene:

Date of Acclimatisation From: Saturday , 14 September 2013 To: Saturday , 14 September 2013

SampleID	PTCIdentity	TGPLUGPLId	VectorID1	Promoter1	Gene1	VectorID2	Promoter2	Gene2	GlasshouseTrialID
BMGF1106003-5...	BMGF1106003	BMGF1106003-5...							GT1-FOC
*									

Report

Export to Excel

Control Form

Exit

3.18 Tracing Module

Purpose of this module is to trace all the ID which have used the selected plant ID for its creation or has acted as a parent for any plant.

This module Traces both active and trashed plants.

The process shown below is the same for all the other tracing reports.

Select the required tracing module

1. Select the year

Clear before starting any new report.

2. Get the IDs under that year

3. Both active and trashed plants under that year is displayed.

4. Press to get the reports. Only one type will work at a time.

5. Generated reports

The Tracing Module - MG Project

Please Select the Year: 2011

Select or Enter the Explant Identity(ACTIVE): MFC110005

Select or Enter the Explant Identity(TRASHED)

Active Plants of the Selected Explant Identity

CSCIdentity	TransformationID	PTCIdentity	TMPLUMPLId	TGPLUGPLId	TFPLUFPLId	FieldTrialPlantID
CSC1102004	BMGF0470001	BMGF0480001	BMGF1106001-13-TMPL	BMGF1106001-3-TGPL	BMGF1106003-10-UFPL	FT12005
CSC1102005	BMGF0870002	BMGF1106001	BMGF1106001-17-TMPL	BMGF1106001-5-TGPL	BMGF1106003-11-UFPL	FT12006
CSC1102007	BMGF1104003	BMGF1106003	BMGF1106001-24-TMPL	BMGF1106003-5-UGPL	BMGF1106003-14-UFPL	FT12007
	BMGF1104005	BMGF1106009	BMGF1106001-2-TMPL		BMGF1106003-8-UFPL	FT12008
	BMGF1104006	BMGF1106012	BMGF1106003-3-TMPL			

Export to Excel

Trashed Plants of the Selected Explant Identity

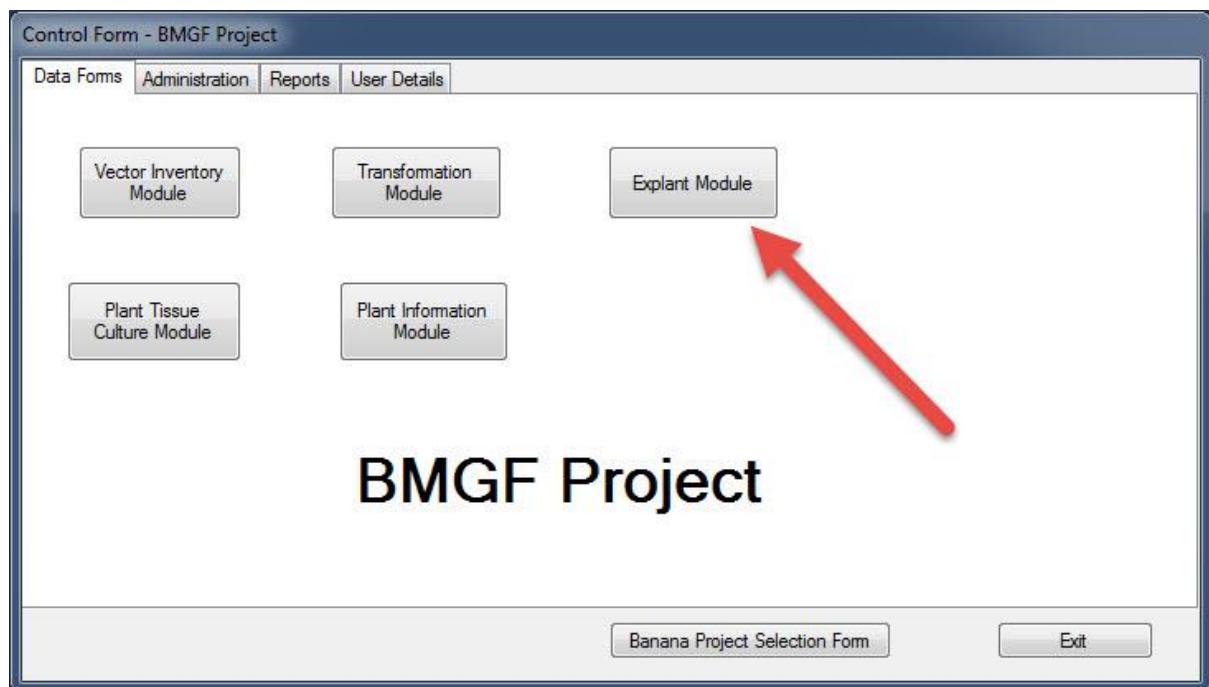
CSCIdentity	TransformationID	PTCIdentity	TMPLUMPLId	TGPLUGPLId	TFPLUFPLId	FieldTrialPlantID
CSC1102014	BMGF1104002		BMGF1106001-14-TMPL	BMGF1106001-20-TGPL...	BMGF1106001-10-TFPL	FT12002
	BMGF1104011		BMGF1106001-16-TMPL	BMGF1106001-4-TGPL ...	BMGF1106001-11-TFPL	FT12009
	BMGF1104017		BMGF1106001-1-TMPL		BMGF1106001-12-TFPL	FT12010
					BMGF1106001-9-TFPL	

Export to Excel

Form To Picture Control Form Exit

There is no relationship among the columns in the report. As an example PTC ID BMGF0480001 has no relationship with Transformation ID BMGF0470001 CSC ID CSC1102004.

3.19 Explant Module



Enter a New record

The flowchart illustrates the steps for entering a new record in the Explant Module:

1. Select the Source Type
2. Select the Source ID
3. Press to Display the data and Enable Generate ID button
4. Generate the ID
5. Enter the Data
6. Select ready to culture or not
7. Enter subculture data
8. Save the Record
9. Export to Excel

The form itself contains the following fields and sections:

- Source:** TFPL, UFPL
- Vector ID:** BMGF1106008-7-TF
- Promoter:** ACS ACS ACO
- Gene:** CrtI Dxs Pay1Q60
- Cultivar:** Gros Michel
- Field Trial Plant ID:** FT12003
- Year:** 2015
- Explant Identity:** BMGF1508005
- Explant Identity Type:** TE
- Tissue Type:** Meristem
- Date of Initial Culture:** Thursday, 9 July 2015
- Media:** M4
- Additives:** AntiOx, GA3, IAA100, Kan100, Kan50, STS, Tim200, Tim300
- Lab Book Number:** 4
- Page Number:** 55
- Ready to Culture?**: Yes / No
- Number of Cultures:** 12
- Date of Culture:** Thursday, 9 July 2015
- Cultured By:** becker
- Comments:** sdfgsdg
- Buttons:** Save Starter Culture and Sub Culture, Form To Picture, Control Form, Exit
- Checklist:** Select the Fields Required to be Exported to Excel (checkboxes include main_ExplantID, main_ExplantIdentityType, main_Cultivar, main_NumberOfStarterCulture, main_Media, main_Additives, main_LabBookNumber, main_PageNumber, sub_NumberOfCultures, sub_DateOfCulture, sub_CulturedBy)
- Buttons:** Export to Excel, Clear the Form