



User Guide

Image Analysis



AIM facilitates the processing of images, using third-party software (ImageJ).

AIM enables you to: establish a framework for your studies (date, client, species, device); carry out processing operations and obtain results (in one click); archive the following in a database:

your series of images; your processing operations (ImageJ macros); your results files; your individual measurements; your clustered measurements (grouped by variety, image, etc.). calculate new measurements (for example: convert pixels to millimeters); cluster results (by variety, image, series) and to present them (filtered, in table format, in the form of a graph, for export into Excel,...).

- *AIM* simplifies processing operations for users by encapsulating them (automatic execution, one click) through the integration of history functions (traceability), rights management (user or super user), color management (UPOV, RHS,) and by displaying results in the form of a graph (curve, histogram).
- **AIM facilitates** multi-user, multi-workstation usage of the same project (study), as well as the sharing of processing operations (ImageJ macros) or results between partners (bodies, companies,).

The field of imaging is becoming an increasingly integral part of our studies and professional projects on a daily basis. The tools available on the market are frequently expensive and too specialized.

AIM will facilitate the processing of images, performed using ImageJ software, while offering significant flexibility with regard to the subjects studied (plant, medical, spatial, industrial,...).

Some examples of image processing performed using series of GEVES images:

- Surface measurements, height and width of gr	rains.
	(back-lit table, corn, 2009)
- Surface spread of fungus on leaves.	
	(scanner, wheat, 2010)
- Surface measurements, height and width of lea	aves.
	(scanner, rape seed cotyledons, 2010)
- Surface measurements, height and width of flo	ower petals.
	(scanner, flax, 2010)
- Ground coverage of plants.	
	(camera in field, peas, 2011)
- Kinetics of seed imbibition and germination.	
	(Jacobsen table, multiple species, 2011)
- Surface and perimeter measurements to define	e the thickness of leaves.
	(scanner, carrot tops, 2011)
- Quantification, labeling of colors on leaves ar	nd flowers.
	(back-lit table, peas and orchids, 2012)
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1 – Software installation (GEVES)

1.1 – Initial installation

Depending on the site you are using (for example, the Magneraud site), double click on the file INSTALL.EXE file in the directory $\underline{Z:WindevAIM}$, then follow the installation assistant's prompts, clicking on *Next* at each stage.

Nessan	Welcome to setup wizard	
PP	This program will install software on your workstation. Tip: end all current Windows applications before launching setup.	
R	Application will be installed in following directory:	
	C:\Program Files\Gaia	
1-0		
	Advanc	ed

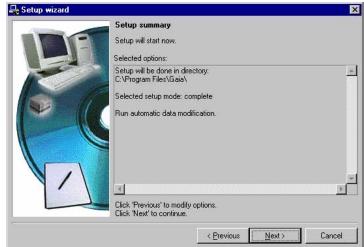
1. Click *Yes.* The installation assistant will then display a summary of the installation process:

Non

Do you want to create it?

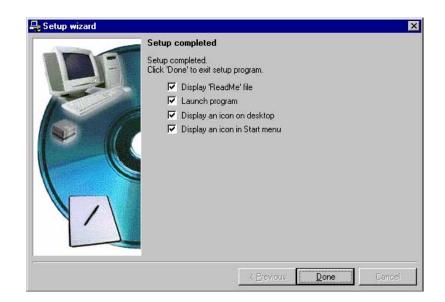
<u>D</u>ui

1



2. A message will indicate the end of the installation process, as well as prompting you to create icons and launch the program:





3. Click on *Finish*.

1.2 – Automatic updates (GEVES)

Once the AIM application has been networked, updates will be installed automatically. As soon as a new version is available, an automatic update prompt will appear when the application is launched.

Mise à jour automat	ique de SOS
	Une mise à jour de cette application est disponible. Pour utiliser cette application, cette mise à jour est obligatoire.
	Que souhaitez-vous faire ?
	Mettre à jour l'application (57 s) Utiliser la version installée Quitter l'application
	Informations sur la mise à jour :
	Version actuelle de l'application : 1.01Z
	Version de la mise à jour : 1.02A
	Détails 💿

2 – Connection to AIM (GEVES)



The password used to connect to the database is the same as that used for all Oracle databases:

Identification	on 💽	
Login:	moutaultb	Surname + Initial of first
Password:	••••	name
Server	Ange_Adre	Database
	OK Cancel	

<u>Note</u>: if you do not have an Oracle account, contact our database administrator (DBA) <u>christophe.chevalier@geves.fr</u>

When you first connect to the database, an information window will pop up and ask you to find your name in the address database:



touni@gev

If your name appears in the window, select it and click on OK.

Should your name not appear, search for it by clicking on "Full list individuals".

If your name does not exist in the address database, create a profile by going to Start\Programs\Adr\Adr

3 – General overview

3.1 – Main menu

3.1.1 – Title bar

AIM - Managing image processing and analysis The title bar indicates the name of the software package and the active menu in square brackets.

3.1.2 – Toolbar

The toolbar which appears in the start window remains available in all the main windows of the software package, although certain buttons may sometimes be inactive, in which case no action is possible, and they may be greyed out. The following functions are available:

	Quit, Close	F2
P	Go to first entry	F3
¢	Go to previous entry	F4
4	Go to next entry	F5
	Go to last entry	F6
2	Search for entry using selection criteria	F7
0	Delete selection criteria	Ctrl + R
6	Manage selection criteria	Ctrl + G
3	Refresh	F8
÷	Add entry	F10
1	Modify entry	F11
-	Delete entry	F12
B	Print current	Ctrl + P
	Import	Ctrl + I
15	Export	Ctrl + E
<u>s</u>	Copy entry	Ctrl + D
\bigcirc	Select / Unselect All	Ctrl + M
	List of data values	F9
9 **	Help	F1



3.1.3 – Status bar

The status bar indicates the path of the database, in line with the application, the current (connected) user and the current field. The date and time also appear on the right.

Current DataBase = Ange_Adre (User = moutaultb) Current field = Img_Image1	03/12/2013	11:48:23	
--	------------	----------	--

3.1.4 – Menu bar

The menu bar and sub-menus enable you to access the various windows of the software package by left-clicking. However, you can use the keyboard by holding down the Alt key and pressing on the appropriate (underlined) letter at the same time.



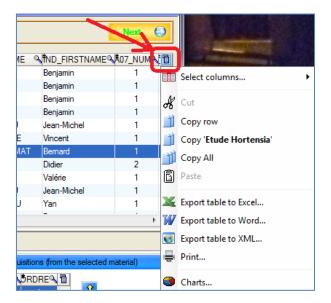
Comment: Additional information on this menu bar is available further on in this Guide.

3.2 – Functions available in different windows

3.2.1 – Exporting a table

The icon can be found in the top right-hand corner of all tables. This icon provides you with the following options:

- You can export the information contained in the window into various formats: Excel, Word,



- You can select columns to display or hide (or this can be done directly by rightclicking on a column heading)

List of studi					
T_C_ETU	× [‡]	A01		A205_A_LIBELLE	
17	Comparaison Could		A01_C_ETUDE_SERV		NAKTUINBOUW
12	Couleur des Feuille	~	A01_C_ETUDE		Groupe d'Etude et de
2	Couleur des Fleurs				Groupe d'Etude et de
54	Decoupe de petale	~	A01_A_NOM		
40	Dénombrer des pla	~	A205_A_LIBELLE	t	Groupe d'Etude et de
41	Distinction de Grai	~	ETS LIB		Groupe d'Etude et de
60	Etude Hortensia		15_10		Groupe d'Etude et du

3.2.2 - Sorting and searching

_

It is possible to sort columns by clicking on the column heading.

A205_A_NBELLE		6	6				
The symbol ≢ indicates t	hat	the column is so	ortable.				
The symbol indicates that the column is sortable and currently sorted (in Ascending order).							
The symbol indicates that the column is sortable and currently sorted (in Descending order).							
The symbol 🔦 indicates t	hat	a value search c	an be performed	in the colum	n.		
Left click on the magnifying glass value.	and	d fill in the					
value.			Prénom Demandeur	07/=/_*	Date Souhaitée		
Or right-click to open the menu;			hristophe	07/07/06	07/07/06		
Search and Filter.			hristelle	07/07/06	08/07/06		
			hristelle	07/07/06	07/07/06		
			u	07.07.000	17107100		
A01_A_NOM				IND_NAME NTND_F	IRS		
2012 - Projet SCLEROVAR - feuilles de colza	~	Find	10	UTAULT Benjar	min		
2013 - Projet EURALIS - feuilles de colza	7	Filter	•	Is equal to			
2013 - SCLEROVAR - Cotylédons & Feuilles Comparaison Couleur Appareil Photo		Delete the filter					
Couleur des Feuilles				St <u>a</u> rts with			
Couleur des Fleurs (Orchidées)		Is equal to '2012 - Projet S	CLEROVAR'	<u>C</u> ontains			
Decoupe de petales / fond		Is equal to '2013 - Projet E	URALIS - f	End <u>s</u> with			
Dénombrer des plantes (jeunes)					n		
Distinction de Grains (Maïs)		Is equal to '2013 - SCLERO	-	Is <u>d</u> ifferent from			
Etude Hortensia Etude Syngenta Maïs 2009	1	Is equal to 'Comparaison C	ouleur Appar'	Does not start <u>w</u> ith			
	-	Is equal to 'Couleur des Fe	uilles'	Does not con <u>t</u> ain			
		Is equal to 'Couleur des Fle	eurs (Orch'	Does <u>n</u> ot end with			

3.2.3 – Layout of columns in a table

If the column layout is not suitable, it is possible to move the columns simply by using drag-and-drop.

All column widths can be adjusted to suit the user. In order to do this, position the mouse cursor on the column dividers and move them to the right or the left, while holding the left mouse button down.

When browsing the left-hand part of the title of a column, a padlock will appear. You can set the columns to the left of the padlock by clicking. This means that, when you move the horizontal bar, the left-hand columns will not move anymore.

3.2.4 - Managing windows and tables

The windows have "splits" (horizontal or vertical split bars) which allow you to modify the size of tables and other items.

Liste des cara

Place the cursor over the split (the cursor changes to a double arrow), hold down (left click) and move the cursor.

In certain windows in AIM, you will find search criteria in the upper left-hand corner of the tables. Select fields to filter the list.

Search	Criteria (You ca	in use t	ne %)	
Code		×	Туре	• ×
L				

You can use % as a search criterion and the **X** button allows you to delete these criteria.

3.2.5 – List of values

Certain entry fields allow you to call up a list of values. Simply place the cursor over the entry field and press the [F9] key. A window will open and you must select a value and validate. The information will be added to the entry fields.

Filter the request: Enter a letter, for example "m" Press [F9]

Select "Mint" and click on [Ok]

	Type	م [‡]	Code	a) [‡]	Nom	Q
DHS		40551		Betterave		
DHS		40801		Blé		
DHS		40757		Colza		
DHS		40810		Laitue		
DHS		40500		Mais		
DHS		42068		Nectarinier		
DHS		40703		Orge		
DHS		41030		Pêcher		
DHS		40839		Tomate		
DHS		40770		Tournesol		

ste de val	eurs	
🕈 Type 🔍	[€] Code	a,†
DHS	40 850	Mâche
DHS	43 150	Magnolia à grandes fleurs
DHS	43 013	Menthe
DHS	43 524	Millet des oiseaux
		<u> </u>
	Liste des e Type of DHS DHS DHS	Type Q Code DHS 40 850 DHS 43 150 DHS 43 013

The information and the relevant code are added to the species field.

- *Note*: The symbol "%" can also be used and is compatible with previous versions of GEVES applications (GAD, DHS, VAT, GED, GEV,...).
- *Caution*: If the criteria you enter are too narrow, the list of values will remain empty, for example if the code begins with "9"

Species	9	m
---------	---	---

4 – "File" Menu	
	File Send message Application Change base Change password Screen capture Exit

4.1 – Send a message

In order to render the application more interactive, AIM provides you with the possibility of managing a messaging system. To access this system, click on *Send a message* in the *File* menu.

When you first launch the application, click on the \square	Account	button.
---	---------	---------

The accounts	Toppet			
Name of the account:	benjamin moutault			
Email address:	benjamin.moutault@geves.fr			
Main account				
SMTP server address:	Smtp.Geves.Fr			
New	Delete Modify	Add Cancel		
Click on the tabs to show a messages or Sent message		List of accounts: the selected by default	main account	is
My messages		List of accounts: benjamin moutauit		
New messages	[
P Addressee	Subject	⊲,¢ Date ⊲,¢ Hour⊲,¢	Addresser	
•	m		•	
	abe 🖉 ▾ A ▾ 툴 툴 툴 툴			Click here to
				ndicate the path of
			1	he file attached to
Attached files:				he message
Account Refresh Send	New message New	r message Delete Print	Quit	
			.:i	

Functions of the different buttons:

- > Account Enables you to delete, modify or create a new account (see point 3.1)
- Refresh Enables you to update data following any modifications or additions.
- Enables you to send a message.
- ► **New message** Enables you to create a new message.
- ► Modifier message Enables you to edit an existing message.
 - Delete Enables you to delete a message.
- > Print Enables you to print a message.
- Enables you to exit the messaging system.

4.2 – Application (GEVES)

GEVES applications can be accessed directly through AIM without users having to re-enter their identification details, thanks to the option "Use the same log-in". If the required application is not on your computer, it will be installed automatically.

	ADR Gestion des Adresses
Application	AIM Gestion des traitements et d'analyses d'images
	COM Gestion du système d'information du service Communication
	DEM Demeter
	DHS Gestion des étude DHS
	DVP Gestion des tables de développement
	FAC Facturation Sev
	FID Gesion des Fiches Descriptive
	FIJ Logiciel d'analyse d'image Fiji
	FLY Outil de requêtage graphique Fly Speed Sgl Query
	GAD Gestion Administrative des Dossiers
	GAIA Logiciel de distinction variétale
	GDN Gestion des dénominations
	GED Gestion des Essais Dhs
	GEV Gestion des Essais Vat
	GRT Gestion du Référentiel Thalie
	GTD Gestion technique des dossiers
	GVA Gestion des variétés
	HYD Gestion des Ressources Humaines (Hydromel)
	IMJ Logiciel d'analyse d'image ImageJ
	LIM Outil de gestion de formulaires en ligne LimeSurvey
	NEP Gestion des Informations Biogeves (Neper)
	OLA Outil de dépot de formulaire d'inscritption variétale en ligne (On Line Application)
	PAS Pathologie des Semences
	PHY Analyse Physique
	RRR Logiciel de statistique R
	SEM Gestion des Semences
	SIL SilverPeas Outil Collaboratif
	SIR Gestion de la saisie portable
	SOS Gestion centralisés des demandes d'un service
	SYN Logiciel de synchronisation de répertoire et/ou d'épuration de répertoire
	VAT Gestion des études VAT
	Utiliser les mêmes identifiants



4.3 – Switch database (GEVES)



This submenu enables you to connect directly to another database, without closing the application.

The prompt window displays a list of all available servers. Those ending in "Adre" concern data from production sites and those ending in "Copi" allow you to work on a copy of the database of one of the sites. The copies are loaded from production data

from a site following a simple request.

🎃 Change database	
Server Ange_Adre	Cancel

4.4 – Change password (GEVES)

It is possibly to change passwords directly in AIM.

Enter the new password and click on the "Ok" button in order for the password to apply to all GEVES applications on all sites.

💐 Mot de passe						
Base Oracle (Adr, Hydromel, Th	alie,Pas,Phy,)					
<u>N</u> ouveau mot de passe						
<u>C</u> onfirmation						
LDap Inra						
https://www7.inra.fr/internet/Produits/baomdpldap/						
Qk		<u>F</u> ermer				

4.5 – Screen shots

As the name suggests, when you click on "screen shot", an image (.jpg) is saved on your computer.

This image corresponds to what is displayed within the software package on the screen.



Then a window opens,

informing you of the location of the file image which has been generated and asking you if you wish to view the image.

This keeps your various settings for a future session and closes the AIM software package.

5 – "Referential" Menu							
	<u>B</u>	eferential	_				
	Am	Experimental condition					
	া	Medium and Source					
	?	Zone Device					
	٩	Colors	۲	List of Colors			
	Ŧ	List of Values	-	<u>Color Functions</u>			
	8	Species - Individual - Company					

5.1 – List of values

This window allows you to manage information in the secondary tables, contained in the main windows. There are three tabs available that enable you manage the different values for TYPES and VARIABLES for the AIM application.

Image: Solution Image: Open Links Imag	这 <u>F</u> ile	<u>S</u> tudy <u>M</u> acro	East Processing	Processing Software	<u>R</u> eferential	<u>O</u> ptic	ns M <u>o</u> du	le Wi <u>n</u> dow <u>H</u> elp)		_ 8 ×
MM201 PVPE INVEE A201_ALBELLE IR_UOUR_REE NOT COOPN A201_ALBELLE IR_UOUR_REE IR_UNDER-Scher 183 IR_UNDER-Scher 184	🚺 🛥 I	> > = ?	0 0 🔕 f	· 🔺 🗕 🕭 🖻	📧 🖭 🧯	2 🗖	2		A205_A_L	IBELLE	
BOLCCORN AOD_ALUBELLE PL_CORN_RET AOD_ALUBELLE PL_CORN_RET EC Extende 133 III Intele - Nonder 133 IIII Intele - Nonder 133 IIII Intele - Nonder 133 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Variable	Result and Condition	Image, Obje	t, Etude and Stat Type		File T	/pe				
EC Echele 0 • II vibile - Coder 133 III vibile - Coder 133 IIII vibile - Coder 134 Vibile - Coder 0 0 Science - Coder											
It India-Coular 183 II India-Coular 183 III India-Coular 183 III India-Coular 183 III India-Coular 183 III India-Coular 183 IIII India-Coular 183 IIII India-Coular 183 IIII India-Coular 183 IIII India-Coular 183 IIIII India-Coular 183 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII			A201_A_LIBEL	LE		88 🔂			A204_A_L	IBELLE	1
II Instate-inverte 133 III Instate-inverte 133 III Modifier-Coder 133 IIII Modifier-Coder 134 IIII Modifier-Coder 134 IIII Modifier-Coder 134 IIII Modifier-Coder 135 IIII Modifier-Coder 134 IIII Modifier-Coder 135 IIII Modifier-Coder 135 IIII Modifier-Coder 136 IIII Modifier-Coder 136 IIII Modifier-Coder 136 IIIII Modifier-Coder 137 I						^					^
IN Made - Codeur - Relate 183 MC Modifie - Codeur 183 NB Modifie - Codeur 183 NDEF Modifie - Codeur 20 MC Modifie - Codeur 20 MC Modifie - Codeur 20 MC Supposé - Codeur 20 AM05 TYPE ETUDE 20 Soc CORN A205_ALIBELLE 10 ODDO Constation 20 DEV Modifie - Codeur 20 MM05 TYPE ETUDE 20 ODDO Constation 20 DEV Modifie - Codeur 20 ME Modifie - Codeur 20 MDDE Note F COUN Control DEV Modifie - Codeur 20 MDDE Note F Note F Not defin PAH SNES - Pathodyne MNN Modifie - Modifi											
MC Modifier-Coulour 183 NB Norma de Gin 720 NC Nearous de Gin 366 NDEF Non Defini 0 SC Suegrossier-Couleur 20 AIM205_TYPE_ETUDE A005_A_LIBELLE 0 COLO Colored Colored OCLO Colored Colored DBMO Demonstration Exercise Stopenole DK Exercise Colored DK Colored Colored DBMO Demonstration Exercise Stopenole DK Exercise Stopenole DK Exercise Colored DK Exercise Stopenole PATH Stopenole Attraction Stopenole Exercise Attraction VDEF Norderin Attraction Stopenole Exercise Attraction <td></td> <td></td> <td>faire</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			faire								
NB Nor et Bino; 720 NC Nexu de Gio 96 SC Speptode - Coulear 0 SC Speptode - Coulear 20 AM205_TYPE_ETUDE 20 205_C_COOPA A205_A_LIBELLE 1 205_C_COOPA A205_A_LIBELLE 1 206_C_COOPA A205_A_LIBELLE 1 206_C_COOPA A205_A_LIBELLE 0 206_C_COOPA A205_A_LIBELLE 0 206_C_COOPA A205_A_LIBELLE 0 206_C_COOPA A205_A_LIBELLE 0 206_C_COOPA A206_A_LIBELLE 0 206_C_COOPA A206_A_LIBELE 0 206_C_CO_COMPTER											
NDEF Non Defini 0 SC Superpose - Couleur 20 AM205_TYPE_ETUDE											
SC Superpose - Codeur 20 AM205_TYPE_ETUDE A026_A_LIBELLE A026_A_LIBELLE 205_C_COORA A026_A_LIBELLE A026_A_TEXTE_SQL DEMO Coloration BC_C_CORA A026_A_TEXTE_SQL DEMO Coloration BC_C_CORA A026_A_TEXTE_SQL Image: Coloration DEMO Coloration BC_C_CORA A026_A_TEXTE_SQL Image: Coloration DEMO Coloration BCAT Extender MAX NDEF Non definit MAX Meanum MAX PHEN SNES-Phonogice MIN More Mathematice AVG PHEN SNES-Phonogice MIN More Mathematice AVG NDEF Non definit AVG AVG More Mathematice AVG NOU on constructin Coloration	NC	Niveau de Gris			366						
AM205_TYPE_ETUDE 205_C_CODPA 206_C_COPA 206_C_COPA <td>NDEF</td> <td>Non Défini</td> <td></td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	NDEF	Non Défini			0						
205 C_COPA A205_A_LIBELLE 1 1 4206_A_TEXTE_SQL 1 00L0 Coloration COUN Compte COUNT 1 DEMO Demonstration EXT Externer Stoppe Stoppe Stoppe Stoppe Stoppe Stoppe Stoppe MAX Maximum Maximum <td>SC</td> <td>Superposée - Coule</td> <td>ur 🛛</td> <td></td> <td>20</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	SC	Superposée - Coule	ur 🛛		20						
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10 modify information, double click on a						~ ~		TS TES	T		
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To delete information, select a row and

use the **b**utton or the shortcut key [F12] and then confirm the deletion process.

 EV
 EVOLUTION (suivi)

 ME
 MESURER

 TS
 TEST

 ss
 Sdsdsds

 Question
 X

 Voulez-vous vraiment supprimer la/les ligne(s) ?
 de la table Aim_Fen_Liste_Valeur.Tab_AIM205_TYPE_ETUDE

 Oui
 Non

5.1.1 – Condition

"Conditions" describes the framework within which you have acquired your series of images. Conditions enable you to keep a specific numerical value for each study acquisition.

The most common example is keeping the "magnification" ratio, in order to ensure traceability and/or to use it during the image-processing phase, or the calculation phase, to transpose measurements in pixels into millimeters.

The table AIM200_VAR_CONDITION contains a (unique) code and a label.

AIM200_VAR_CON A200_C_CODE		1
DELA	Délai t0-t1	*
DURE	Durée exploitation	
FREQ	Fréquence	
GROS	Grossissement	
HREF	Heure référence	
IREF	Image référence	
LUMI	Luminosité	
NCPC	Nombre Cellule Par Colonne	
NCPL	Nombre Cellule Par Ligne	
RADM	Radicule Minimum (Longueur)	
SEMO	Semence morte	
SDEP	Seuil déplacement	
TEMP	Température	-

Reminder: The rows highlighted in red indicate that the registered entry is already being used in a study and can no longer be deleted or modified.

5.1.2 – Result variables

Result variables have two uses:

- extracting measurements (columns) from results files, predefining them by their labels;
- calculating new result variables using a formula applied to a results table (similar to the way in which spreadsheets (Excel) work).

	VAR_RESULTAT [76]	A		<u>له</u>	4	۵		
<u>€</u> C_C∢	A202_A_LIBELLE	N_OR	102_A_UNI19	<u>_</u> CA	L202_A_LIB_IMAGE	×	A202_CL_FORMULE	21
12	Champ/Feuil	12	rapport		Rapport Champ/Feuil			
13	Finesse Feuille	13	rapport			//	= Surface des plantes / Périmètre des plantes	
5	Longueur Courbe	14	pixel		Curve_Length			(=)
6	Largeur Courbe	15	pixel		Curve_Width			
16	Image	16	numéro		Num_Image			
17	Volume	17	mm ³	1		//	= 4/3 * [racine(Surface / Pi)]3	
18	Distance	18	mm	1		//	= Ecart du centre d'inertie par rapport à une image de	réfi
19	Temps	19	heure	1		//	= Fréquence * (numéro d'image -1)	-
POUR	Surface des plantes / Périmètre des pla TOUTE LIGNE DE \$TAB\$ 5\$ = {9} / {4}	ntes				IGRO SLIG SRE		
On t		<i>,</i>			view of the f	or	ns to manage the variables. mula for the selected row. e that may be used in the formu	las.

The following elements are required in order to create a new variable:

a unique number; a value for the 'display order" (presentation of results); a label; the unit in which the variable expressed; the variable type;

the heading of the column or formula.

If the variable is intended to contain measurements **<u>extracted</u> <u>from</u>** results files, the column heading must be specific. For example, to retrieve surface area measurements, use the heading:

"Area"

If the variable is intended to contain measurements **<u>calculated</u>** on the basis of a formula, its wording needs to be edited. For example, in order to transpose surface measurements, from pixels to millimetres², the formula is

area pixel
(magnification) ²

Cre	ate ,	/ 1	viodity	vari	able	e resu	ilts		-			~	_
•			77]	Disp	lay O	rder			77		
aptior	n	Na	ame of t	he v	ariał	ble re	sults						
nit		Sp	pecifies	the u	unit (of this	varia	able				-	
esult	Varia	abl	e:										
			l, of a m d, with a				e.						
lumn	Nar	ne	, for ext	ractio	on :								-
		Tì	tle of the	e col	umn	in th	e resi	ult file	es				
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		Π											
			Captio	n	Area	а							
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	For	m	ula										
	//		= Surf	ace	/ m	nagn	ficat	tion	2				
			JR TO ES \$ =								211		
	FI				< U	pulse		ο ([n			-//		

POUR TOUTE LIGNE DE \$TAB\$ and FIN must be added on either

side of the formula, in order to apply the calculation to all the rows to be displayed.

You must replace:

pixel surface area	with	
magnification	with	
squared	with	1

{1} which is the unique number of the variable[MAGN] which is the unique code for the conditionpower (..., 2) which is a Windev function

N

Ca

Ur Re

0

Со

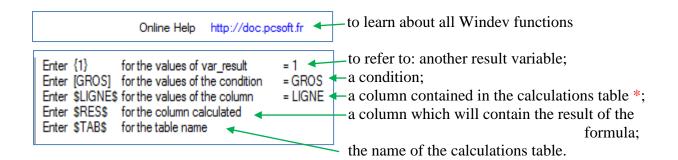
Comments can also be inserted, by starting the row with a double slash.

// then my comment

	Caption	Volume
Another example involves a formula which allows you to calculate the volume of an ovoid shape.		mm ³ able : ted, of a measu ated, with a for
With the same surface variable {1},		

With the same surface variable {1}, magnification [MAGN] and the following Windev functions: "root", "power" and "pi".

Unit	mm ³
Result Varia	able :
extract	ted, of a measurement file.
calcula	ated, with a formula.
Formula	
POUR TO	* [root (Area / Pi)]3 UTE LIGNE DE \$TAB\$ root((({1}/(power([MAGN], 2)))/ValPI), 3)*ValPI*(4/3)



* See the Calculation window (§ 9.4) for the list of columns present (row, image_name, ...)

	-	Calculate		ZONE_NUM
	ZONE_NAME	NT IMAGE_NAME	•	ZONE_NAME
IMAGE NUMBER				IMAGE_SERV
InitiaL InitiaL				IMAGE_NUMBER
✓ IMAGE_NAME			~	IMAGE_NAME

5.1.3 – Type - Image, Object, Study and File

AIM201_TYPE_	IMAGE		
æ01_C_CODI®	A201_A_LIBELLE	IB_JOUR_RE	
IC	Color	183	*
NB	Black and white	730	
NC	Grayscal	366	
NDEF	undefined	0	

This feature enables you to describe the images and their various states (color, black and white,...). The column entitled "number of days archived" enables you to define the time period during which an image will be stored before you are prompted to delete it.

AIM204_TYP	E_OBJET	
04_C_CO[%	A204_A_LIBELLE	1
VAR	variety	*
SEM	Seed lot	
NDEF	Undefined	

This feature enables you to describe the objects being studied (type of material used).

AIM205_TYPE_	ETUDE	
205_C_CODP	A205_A_LIBELLE	1
OL	Object lesson	*
GERM	germination phenotyping	
EXE	example	
EVO	evolution (monitoring)	

This feature enables you to describe studies, for example, by function type (taking measurements, counting, examples, ...) or by user type (seed sector, plant varieties sector, pests sector,...).

AIN	4207_TYF	PE_FICHIER		
8 7_	_C_C0I%	A207_A_LIBELLE	B_JOUR_RE	Т
	FRA	Result file AIM	0	*
	FRI	Result file (unintegrated)	0	
	NDEF	undefined	0	
	SFR	without result file	0	

This feature enables you to describe the results of image processing operations. Essentially, the processing operations produce a results file which is integrated into the database (FRA type), but they can also generate other types of files, which are not destined to be integrated (for example, a report file) (FRI type).

There are also processes that do not generate any results files, such as processes which modify the color of images.

The column relating to the number of days archived enables you to specify the length of time for which a processing result will be archived you are prompted to delete it.

5.1.4 – Statistical parameters

AIM206_PAR	AM_STAT		
₿ <mark>6_C_CO</mark> [%	A206_A_LIBELLE	A206_A_TEXTE_SQL	
NDEF	undefined	AVG	*
MOYA	arithmetic mean	AVG	
MINI	Minimum	MIN	
MEDI	Median	MEDIAN	
MAXI	Maximum	MAX	
ECAT	standard deviation	STDDEV	

This feature enables you to define a number of statistical parameters, by specifying the SQL syntax required in order to cluster the results generated by AIM.

Note: SQL syntax must be compatible with ORACLE for AIM use within GEVES and with HYPERFILESQL for EXTERNAL use.

Example: STD, MAX, MIN, COUNT, AVG, MEDIAN, SUM, VARIANCE, ...

5.2 - Experimental condition



You must define the experimental conditions for each new AIM study. This enables you to provide additional information during the automatized processing of data or calculations.

In general, these conditions are identical within the same study type. That is why experimental conditions are listed by type.

File	Stud	y Macro	Fast Processing	Processing !	Software	Referential	<u>O</u> ptions	Module	Window	Help	_ 6
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1 🗠	• 🗢	🗢 📼 👔	00	t 🖄 💻	۵ 🕒	I 💌 🖭 🤅	2 🗔 🖉				
earch (Criteria (Yo	u can use the %	.)								
Type 🔽	NES - Ph	énotyp: 👻 Na	me	Sn	ecies						
t of list TE_CO		tical conditions	[3] A LIBELLE	о Ють	3 ESQ.‡	C53 V NO	MESP	Q∲TQ∲		A205 A LIBELLE	9
3		ons 2012 SNES		- 1113	-	bece inconnue	/M_LOI	1- 1	IES - Phénoty		
2		ons 2012 SNES				bece inconnue			IES - Phénoty		
1		ons 2014 SNES				pece inconnue			IES - Phénoty		
					-						
		nditions [13]	200 A LIBELLE	Q. [†] N	Add Con			A10 A	REMARQUE		©.I∳OSAN
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LISTE 2 2	DELA DURE	≑ Délai t0-t1 Durée exploitati		 ≪_N	_VAL_CON 1 60	DIT® + hours minutes		A10_A_	REMARQUE		
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LISTE 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	DURE FREQ GROS HREF IREF LUMI NCPC NCPL RADM SEMO	Délai t0-t1 Durée exploitati Fréquence Grossissement Heure référence Luminosité Nombre Cellule Radicule Minimu Semence morte	Par Colonne Par Ligne Im (Longueur)	≪ [*] N	_VAL_CON 1 60 120 80 4 0 5 5 5 1 0	DIT® hours minutes minutes pixels hours		A10_A_	REMARQUE		
LISTE 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	DURE FREQ GROS HREF IREF LUMI NCPC NCPL RADM SEMO SDEP	Délai t0-t1 Durée exploitati Fréquence Grossissement Heure référence Luminosité Nombre Cellule Radicule Minimu	Par Colonne Par Ligne Im (Longueur)	2 ⁴ N	_VAL_CON 1 60 120 80 4 0 0 5 5 5 1	DIT + +	tal condition	A10_A_	REMARQUE		

This window enables you to consult and manage conditions (add-modify-delete).

5.2.1 - Consult

When the window opens, the list is displayed according to the criteria entered in the search bar. You should use the "empty" study type to display everything. Once you have selected a list, the details will appear in the second table.

5.2.2 - Create / Modify

To open the window to create a list of experimental conditions, use the shortcut key [F10], or click on the button.

ĺ	🎃 Adding a r	new list of theoretical conditions.
	Type of study	
l	Name	
	DUS Species	
		OK Close

Likewise, to modify the experimental conditions, select a list and use the shortcut key [F11], or click on the distance button.

Ì	🎃 Adding a n	new list of theoretical conditions.
	Type of study	Extérieur 💌
l	Name	Count condition
l	DUS Species	40500 Com
		OK Close

Insert the type of study, the title and species. Click on the 'OK' button to validate.

Note: the species is optional, but if it is stipulated by the user, then this list of experimental conditions will only apply to that species.

Once the list has been created, you must add/remove conditions.

In the details table, click on the button, or on Add Conditions to select new conditions (multiple conditions may be selected).

STE_COI	PA,₹	A09_A_LIBELLE	0	RT53_ES [©]	↓ [♥] C53_V_NOM_ESP	° ∿∮_T∿†
3	Conditi	ons 2012 SNES		0	Espece inconnue	PHEN SNES - Ph
2	Conditi	ons 2013 SNES		0	Espece inconnue	PHEN SNES - Ph
1	Conditi	ons 2014 SNES		0	Espece inconnue	PHEN SNES - Ph
				Add	Conditions	
		nditions [13]			Conditions	A10_A_REMAR
	00_C(2			રે. [‡] N_VAL_		A10_A_REMAF
	DELA	A200_A_LIBELLE		N_VAL_	CONDIT®	A10_A_REMAR
	DELA DURE	A200_A_LIBELLE	(N_VAL_	CONDIT®	A10_A_REMAR
	DELA DURE FREQ	A200_A_LIBELLE Délai t0 - t1 Durée exploitation	(≷ <mark>≜</mark> N_VAL_	CONDIT® * 0 0	A10_A_REMAF
	DELA DURE FREQ GROS	A200_A_LIBELLE Délai t0 - t1 Durée exploitation Fréquence	(≷ <mark>≜</mark> N_VAL_	CONDIT® 0 0 0	A10_A_REMAF
	DURE FREQ GROS HREF	A200_A_LIBELLE Délai t0 - t1 Durée exploitation Fréquence Grossissement	(N_VAL_	CONDIT® * 0 0 0 0	A10_A_REMAF

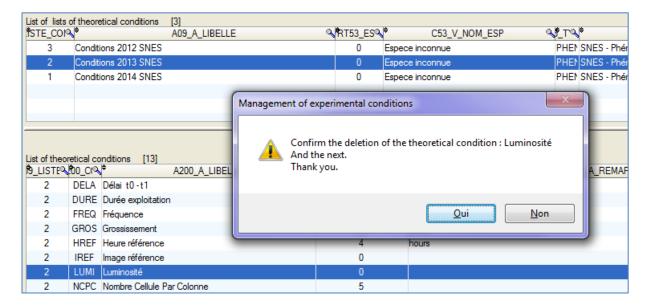
Caution: when conditions are added, they do not, by default, contain any values or comments. It is up to you to provide that additional information by entering it directly into the details table.

List of theo			N VAL CONDIT	\$
2	_	Délai t0-t1		hours
2	DURE	Durée exploitation	60	minutes
2	FREQ	Fréquence	120	minutes
2	GROS	Grossissement	80	pixels
2	HREF	Heure référence	4	hours
2	IREF	Image référence	0	

To remove conditions, select them and use the shortcut key [F12], or click on the 💻 button and confirm the deletion.

5.2.3 – Delete

In order to delete a list of experimental conditions, you must first of all clear the conditions contained therein.



You must select all the conditions, and then confirm the deletion.

Then you can select the conditions list to be deleted by clicking on the 💻 button, or using the shortcut key [F12] and then confirming the deletion.

5.3 – Medium and Source



This window allows you to manage the medium and source for the images used in AIM. You must select the medium/source for each acquisition.

<u>)</u> <u>F</u> ile	<u>S</u> tudy	<u>M</u> acro	East Processing	Processing	Software	<u>R</u> eferential	<u>O</u> ptions	M <u>o</u> dule	Window	<u>H</u> elp		_ 8
🚺 🖙		•	003	+ 🔺 -	- 🕹 🛃	i 💷 🔯 🧭	1 🗆 🖉			SOURCE	[6]	
DURCE	[6]											
OURCE 5_C_BAN [©]	× [‡]	1	A05_A_NOM	٩	₹_NB_CAM	A05_A_	LOCALISATIO	N Q	÷		A05_A_I	REMARQUE
4	Banc_1				4	SNES module 1						
7	Banc_2				4	SNES module 2			send by ESI	EO in 2011		
1	CETIOM				1	Paris			Extérieur			
6	GEVES				5							
5	NAKTUINE	BOUW			1	Sotaweg 22, Pos	tbus 40, 2370 /					
2	UPOV				1				Extérieur			
EDIUM	[4] 2,≹/RA05_R	, 		M		NA D DATE ACH	AD/			Q.¢		
EDIUM C_CAME ^C	[4] ≥,≹VRA05_B [©] 7		A04_A_NC	DM	্ব\$_V/	4_D_DATE_ACH		4_A_RESOL	UTION	0 ,≑		,
EDIUM	N [‡] VRA05_B	Cam_1	A04_A_NC	DM	<. \$_V/ ☑	04/02/2014	2560 x 204	48	UTION	٩.		,
EDIUM C_CAME [©] 15	<mark>∛</mark> \$VRA05_B [©] 7	Cam_1 Cam_2	A04_A_NC	DM	 <!--</td--><td></td><td></td><td>48 48</td><td>UTION</td><td>⊲*</td><td></td><td>,</td>			48 48	UTION	⊲*		,
EDIUM C_CAME® 15 16	NRA05_B [©] 7 7	Cam_1	A04_A_NC	DM	<. \$_V/ ☑	04/02/2014 04/02/2014	2560 x 204 2560 x 204	48 48 48 48	UTION	⊲*		,
EDIUM C_CAME [©] 15 16 17	<mark>∜RA05_B[©] 7 7 7</mark>	Cam_1 Cam_2 CAm_3	A04_A_NC	DM	 ↓ ↓	04/02/2014 04/02/2014 04/02/2014	2560 x 204 2560 x 204 2560 x 204	48 48 48 48	UTION	~ ¢		
EDIUM C_CAME [©] 15 16 17	<mark>∜RA05_B[©] 7 7 7</mark>	Cam_1 Cam_2 CAm_3	A04_A_NC	DM	 ↓ ↓	04/02/2014 04/02/2014 04/02/2014	2560 x 204 2560 x 204 2560 x 204	48 48 48 48	UTION	₹		
EDIUM C_CAME [©] 15 16 17	<mark>∜RA05_B[©] 7 7 7</mark>	Cam_1 Cam_2 CAm_3	A04_A_NC	M	 ↓ ↓	04/02/2014 04/02/2014 04/02/2014	2560 x 204 2560 x 204 2560 x 204	48 48 48 48	UTION	₹		
EDIUM C_CAME [©] 15 16 17	<mark>∜RA05_B[©] 7 7 7</mark>	Cam_1 Cam_2 CAm_3	A04_A_NC	DM	 ↓ ↓	04/02/2014 04/02/2014 04/02/2014	2560 x 204 2560 x 204 2560 x 204	48 48 48 48	UTION	Q		,
EDIUM C_CAME [©] 15 16 17	<mark>∜RA05_B[©] 7 7 7</mark>	Cam_1 Cam_2 CAm_3	A04_A_NC	DM	 ↓ ↓	04/02/2014 04/02/2014 04/02/2014	2560 x 204 2560 x 204 2560 x 204	48 48 48 48	UTION	Q		,
EDIUM C_CAME [©] 15 16 17	<mark>∜RA05_B[©] 7 7 7</mark>	Cam_1 Cam_2 CAm_3	A04_A_NC	DM	 ↓ ↓	04/02/2014 04/02/2014 04/02/2014	2560 x 204 2560 x 204 2560 x 204	48 48 48 48	UTION	~*		,
C_CAME [©] 15 16 17	<mark>∜RA05_B[©] 7 7 7</mark>	Cam_1 Cam_2 CAm_3	A04_A_NC		 ↓ ↓	04/02/2014 04/02/2014 04/02/2014	2560 x 204 2560 x 204 2560 x 204	48 48 48 48	UTION			A04_

5.3.1 - Consult

Select the source (in the main table) to see the various media linked to it (in the detail table).

5.3.2 - Create / Modify

SOURCE

To open the window to create a new source, use the shortcut key [F10], or click on on the 🗗 button.

	🎃 Adding a new source.
	Name
İ	Location
	Remark
	Number of mediums 0
	OK Close

Likewise, to modify a source, select a row and use the shortcut key [F11], or click on the distance button.

Insert the name, location, a comment and the number of media you wish to define concerning this source. Confirm by clicking on the OK button.

🎃 Changing t	the source, n° 4 - 8 📃 🔲 🔀
Name	I.N.R.A.
Location	Beaucouzé
Remark	MR CHEVALIER
Number of med	liums 3
	OK Close

Caution: When modifying the number of media, if you insert a lower number, the last media defined will be automatically deleted. (See § 5.3.3.)

MEDIUM

Then you must indicate the media created automatically at the same time as the "source" (number of media).

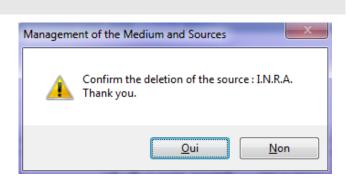
In order to modify the media, use the shortcut key [F11] or click on the solution, or double-click on the row. A window will open allowing you to change the name, validity, date, resolution and comment.

2	UPOV			Ι	Exteneur
8	I.N.R.A.			3 Beaucouzé	MR CHEVALIER
				Modification of the medium, n° 4	
				Name Medium_3	
	[3] \∳VRA05_B [©]	<u>.</u>		Purchase Date 04/02/2014	
	ATVRA05_Bo		A04_	Resolution	RESOLUTION C
19	8	Wine unit			
20	8	Apple unit		Remark	
21	8	Medium_3			
				OK Close	se and a second s

5.3.3 – Delete

To delete a source (and all corresponding media), select the source

and click on the **b**utton, or use the shortcut key [F12], and then confirm the deletion.



5.4 – Zone layout



This window allows you to manage the zone layout used in AIM.

<u>F</u> ile	<u>S</u> tudy	<u>M</u> acro) <u>F</u> ast	Processing	<u>P</u> r	ocessing	Software	<u>B</u>	eferential		<u>O</u> ptions	M <u>o</u> dule	Wi <u>n</u> dow	<u>H</u> elp		_ 8
1 🗁	•		2	0 🔊	†	4 -				0		1				
107_DISI	POSITIF_2	ONE [4]							- 14			A				
_NUM_D				A07_A_	NOM				<u>_</u> N_N	B_2Q	ZONE_IN	ONE_PA	•	A07_CL_E	ESCRIPTION	٩
1	Uniqu									1	1	1				
4	Doub									2	2	1				
2	Carré									4	2	2				
3		zones								16	4	4				
5	Triple									3	3	1				
108_ZON	IF [4]															
3 CRA07	7 NUM D	SPO A	8 C NUM	_ZONE®							A08	_A_NOM				0
-	2		1	H	G											
	2		2	н	D											
	2		3	В	G											
	2		4	В	D											

5.4.1 – Consultation

Select a zone layout in the main table to see the description of the different zones in the details table.

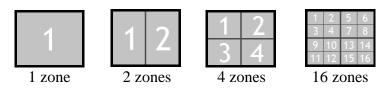
5.4.2 – The concept of ZONES

In image processing, depending on the type of measurements used and the form of the objects being studied, users have a wide range of layout options at their disposal.

The object can be displayed alone or in batches of hundreds of objects. Objects may originate from the same population, or from various populations (population, group, batch, material, variety, replication).

Each group has **one** defined space in the image series: **one** zone.

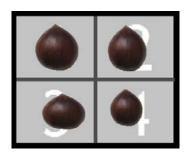
In AIM, you can manage several zones:



Each zone represents one type of material and may contain one or more objects.



1 zone layout with 10 objects per zone



4 zone layout with 1 object per zone

This image layout, which arranges the objects by type of material and number of zones, is called the *zone layout*, and you must to enter it in AIM when declaring studies. (See example § 5.4.4.)

5.4.3 - Create / Modify

LAYOUT

To open the window to create a zone layout, use the shortcut key [F10] or click on the P button.

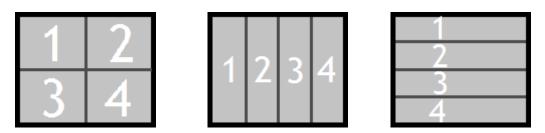
Likewise, to make modifications, select a row and use the shortcut key [F11], or click on the dutton, or simply double-click.

You should insert the name and number of zones you wish to define for the layout. It is also possible to add a description of the layout. Confirm the selection by clicking on the 'OK' button.

🎃 Adding a new	layout.	
Name		
Number of zones	1	
By LINE	1	
By COLUMN	1	
Description		
ОК		Close
🎃 Modification o	of the layout, n° 2	
Name Car	rré (2x2)	
Number of zones	4	
By LINE	2	
By COLUMN	2	
Description		

In order to add more specific information, also insert the number of zones per row and per column. These values will be used to integrate the results (indexing – see § 9.3.3.).

For example, for a layout with 4 zones, AIM distinguishes between 2 by 2 (squared), 4 by 1 (in a row) and 1 by 4 (in a column).



Caution : When modifying the number of zones, if you indicate a lower number, the last zones defined will be automatically deleted. (See § 5.4.4.)

ZONE

Then you must fill in the zones that are created automatically at the same time as the "layout" (number of zones).

To modify those zones, use the shortcut key [F11] or click on the solution, or double-click on the row (TITLE column). Perform the modification and exit the row.

AIM08_ZONE [4]			
A08_CRA07_NUM_DISPO	A08_C_NUM_ZONE	*	A08_A_NOM
5	1	1	
5	2	2	
5	3	Zone 3 is at the bottom left of the images	
5	4	4	

5.4.4 – Delete

To delete a layout (and the zone details), select it and click on the 💻 button, or use the shortcut key [F12], and then confirm the deletion.

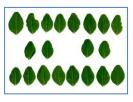
🎃 A	IM - Ma	naging ima	ige proces	ising a	ind analysi	s - [Mar	agemer	nt of zo	one la	ayout '	1							
٢	<u>F</u> ile	<u>S</u> tudy	<u>M</u> acro	<u>F</u> ast	Processing	<u>P</u> ro	cessing 9	Softwar	е	<u>R</u> efer	ential	<u>(</u>	<u>]</u> ptions	M <u>o</u> dule	Wi <u>n</u> dow	<u>H</u> elp		_ 8 ×
		\$	•	٥	0 🔊	†	4 🗖				62	0	🖃 🖉		AIM07_D	ISPOSITIF_ZONE	[4]	
AIMO	7_DISPO	SITIF_ZON	E [4]															
[‡] C_1	IUM_DI8	∖ † _			A07_A_	NOM				Q	N_NB	_29	ZONE_P	DNE_PA®		A07_CL_DESCRIPTI	ON	٦ 🍳
	1	Unique									1		1	1				*
	4	Double									2		2	1				
	2	Carré (2x	2)								4		2	2				
	3	En 16 zor	es								16	6	4	4				
		Square (2x2) COP	Y							4		4					
		NUM_DISPO		1	Confirm de Fhank you.		f the lay	out : Se <u>O</u> ui		e (2x2)	COI		A08_	A_NOM				۰ م
		5 5		2	2		at the bot		-6.46-		_							
		5 5		4	4		st the bot	iom ien	orthe	e image	S							
		J		4	4													-
Currer	nt DataBa	ise = Ange	Adre (User	= mout	aultb) Curr	ent field	-									04/02/2014	16:04:41	

5.4.5 – Example

A study is being carried out on the color of leaves from a dozen plant varieties. A sample of some twenty or so leaves for each variety has been collected in the field.



Ex 1

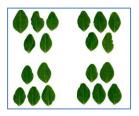


A zone layout with 1 zone is selected so that each scan shows only one plant variety. This will make the operation easier.

A 1 zone layout has been created -

Name	Unique	
Number of zone	es	1
By LINE		1
By COLUMN		1

Ex 2



A zone layout with 4 zones is selected so that. each scan contains 4 varieties or, conversely, so that a single variety may be spread out over 4 scans. This feature ensures that a a failed scan does not lead to the loss of all measurements for a variety. A layout of 4 zones

(squared, 2 by 2) has been created.

Name	Square (2x2)
Number of zone	es	4
By LINE		2
By COLUMN		2

5.5 – List of Colors



This window enables you to consult the color classification schemes, which are used as a repository in the AIM application.

<u>F</u> ile	<u>S</u> tudy <u>M</u> a	icro <u>F</u> as	t Processing <u>P</u> rocessing	ng Software	<u>R</u> eferential	Options	Module	Window	<u>H</u> elp	_	8
1 📼		20	0 8 🕈 🔺	- 🕘 🖻	💌 🖭 🧯	1 🗖 🖉					
earch Criteria	(You can use	the %)——									_
Class UPO	🖌 💌 Lan	guage Engl	ish 🗨 Caption		Code					Color	
t of colors ret	ferenced in All	M [808]								·	-
	CODE_CO		A212_A_LIBELLE	S_N_COD	EN CODE	V9_N_CODE	STATES	END N_COD	E%\$9_N_CODE%	A_CODE_RVB_	21
UPOV	826	16	light red pink	240	130	133	254	200	185	F08285	
UPOV	827	17	red pink	238	105	130	247	203	172	EE6982	
UPOV	827	17	red pink	219	66	102	245	173	143	DB4266	
UPOV	827	17	red pink	216	49	81	247	174	133	D83151	
UPOV	827	17	red pink	221	127	138	250	148	174	DD7F8A	
UPOV	827	17	red pink	216	92	107	250	157	154	D85C6B	
UPOV	827	17	red pink	228	91	106	250	183	160	E45B6A	
UPOV	827	17	red pink	248	117	131	250	230	183	F87583	
UPOV	827	17	red pink	255	133	145	251	255	194	FF8591	
UPOV	827	17	red pink	242	96	105	252	216	169	F26069	
UPOV	827	17	red pink	218	79	79	0	166	149	DA4F4F	
UPOV	827	17	red pink	223	66	83	250	181	145	DF4253	
UPOV	827	17	red pink	255	100	106	253	255	178	FF646A	
UPOV	827	17	red pink	232	54	57	254	203	143	E83639	
UPOV	828	18	light blue pink	207	176	224	197	111	200	CFB0E0	
UPOV	828	18	light blue pink	213	179	229	199	125	204	D5B3E5	
UPOV	828	18	light blue pink	235	139	216	221	180	187	EB8BD8	
UPOV	828	18	light blue pink	207	127	185	224	116	167	CF7FB9	
UPOV	828	18	light blue pink	231	189	238	206	151	214	E7BDEE	
UPOV	828	18	light blue pink	234	183	235	212	144	209	EAB7EB	
UPOV	828	18	light blue pink	222	150	212	218	133	186	DE96D4	1
UPOV	828	18	light blue pink	227	181	223	216	115	204	E3B5DF	
UPOV	828	18	light blue pink	238	167	206	232	172	203	EEA7CE	
UPOV	828	18	light blue pink	228	150	196	230	151	189	E496C4	

5.5.1 – Consultation

As with the other application windows, a search bar enables you to filter the information to be displayed.

Search Criteria (You can u	se the %)			
Class UPOV 💌 I	anguage English	Caption	Code	Color

Choose the color classification scheme: UPOV, RHS or GEVES...

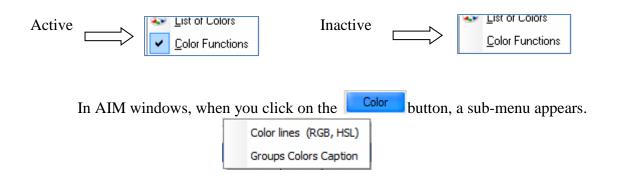
Specify a language: French, English, German or Spanish...

You can also filter the colors referenced in AIM by Label or by Code. The "Coloring" checkbox enables you to color the displayed rows.

Note: Certain languages are not available for some color classes.

5.5.2 – Color Functions

This option enables you to activate the ^{Color} button in the following windows: "Integration", "Calculation" and "Results". (§ 9.3, 9.4 and 9.5)



5.5.3 - Coloring the rows (RGB, HSL)

This feature enables you to color the rows in the results tables described by their plans, for a better visual appreciation of the colors.

This is often achieved using the RGB color model, but also by using Hue, Saturation and Luminosity, or directly by using a number from the AIM color group.

Indicate the color reference.

In order to ensure correspondence between the columns in your results and reference plans, double-

click or use the \bigcirc arrows.

Indicate the color reference					
Red, Green, Blue		\bigcirc	Group numbe	er	
Hue, Saturation, Brightness					
Choose the columns for esta	ablish the mate	h			
Column			Red		
Caption	۵ 🖬		-	Caption	٦ 🍳
TYPE_OBJET_NUM	*				
OBJECT_SERV		0			
OBJECT_NUMBER		0			
OBJECT_NAME					
IMAGE_NAME					-
LINE			Green		
COLUMN			\$	Caption	٦ 🍳
Rouge					
Vert		0			
Bleu		0			
Pixel_%					
RHS_gmp					-
Pixel_%_RHS			Blue		
Rang Couleur RHS			ŧ	Caption	٦ 🍳
		0			
		0			
	-				-

				C h	- fo		lor						
	RESULT_CELLULE				pefc		_						
CT_NUM	M [©] , [‡] OBJECT_NA	ME 🔍 🕈 IMAGE_NAME	্ৰ্	INE	COM-4	Pixel_%	0	RHS_grp	¢	Pixel_%_RH	IS 🔍	Rang Cou	eur RHS 🔍
1	Var_1	D_SF_3-5666_1.bm	b	1	1	0.241177	'	746		0.241177		12	2
1	Var_1	D_SF_3-5666_1.bm		1	2	2.915465	i	726		2.915465		6	
1	Var_1	D_SF_3-5666_1.bm		1	3	0.506278	;	590		0.506278		9	
1	Var_1	D_SF_3-5666_1.bm		1	4	0.253462		774		0.253462		11	1
1	Var_1	D_SF_3-5666_1.bm		1	5	5.181109		217		5.181109		5	
1	Var_1	D_SF_3-5666_1.bm		1	6	7.53275		206		7.53275		3	
1	Var_1	D_SF_3-5666_1.bm		1	7	0.292258		737		0.292258		10)
1	Var_1	D_SF_3-5666_1.bm		1	8	47.83393	1	622		47.83393		1	
1	Var_1	D_SF_3-5666_1.bm		1	9	0.207555	5	791		0.207555		13	3
1	Var_1	D_SF_3-5666_1.bm		1	10	23.85521	6	223		23.855216	i	2	
4		0.05.0.5000 41		-				700		0.005070		-	Þ
				- r	aft	er 🛯 🗖 🗖	lor						
	RESULT_CELLULE Mର୍ବOBJECT NAM		LINE	BLUMA	_	Rouge 🔊	• •	/ert 🔍		Bleu 🔍	¢ Pb	cel% Q	[♥] RHS
1	Var_1	D_SF_3-5666_1.bmp	1	1	1	189		120		136	0.2	41177	74
1	Var 1	D SF 3-5666 1.bmp	1	2		176		92		103	2.9	15465	72
1	Var_1	D_SF_3-5666_1.bmp	1	3		156		152		117	0.5	06278	59
1	Var_1	D_SF_3-5666_1.bmp	1	4		192		197		177	0.2	53462	77
1	Var_1	D_SF_3-5666_1.bmp	1	5		214		96		117	5.1	81109	21
1	Var_1	D_SF_3-5666_1.bmp	1	6		226		118		143	7.5	53275	20
1	Var_1	D_SF_3-5666_1.bmp	1	7		170		57		75	0.2	92258	73
1	Var_1	D_SF_3-5666_1.bmp	1	8		240		230		226	47.	83393	62
1	Var_1	D_SF_3-5666_1.bmp	1	9		121		99		87	0.2	07555	79
1	Var_1	D_SF_3-5666_1.bmp	1	10		227		159		174	23.0	355216	22
		D 05 0 5000 41				101				101		05030	70

Authors : B. Moutault & C. Chevalier Date : 20/08/2012

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5.5.4 – Color Group Labels

This feature enables you to name the colors of the rows of the results tables defined by group numbers, for a better understanding of the measurements. It also allows you to color rows. (§ 5.5.3.).

	😸 Adding color labels
You simply need to: indicate the column containing the number of the color group;	Choose the column [number of color group] to establish the match. Column [♦] Caption OBJECT_NUMBER
	OBJECT_NAME IMAGE_NAME LINE
	COLUMN Rouge Vert
select the language in which you wish the label to appear.	Bleu Pixel_% RHS_grp
Feature enabling you to concatenate the	Pixel_%_RHS Rang Couleur RHS
label and its color code.	
Feature enabling you to color the rows (§ 5.5.3.).	French Choose the language of the label Add the code, of the color class, to the label. Color lines with the number of color group.

AIM14 F	RESULT CEL	LULE IMG [583]	befo	ore	Color			
CT_NUN	/⁰.↓ [®] BJECT_N	IAME	V LINE V	DEDIVIN	RHS_grp		Rang Couleur RHS	a 🗋
1	Var_1	D_SF_3-5666_1.bmp	1	1	746	0.241177	12	·
1	Var_1	D_SF_3-5666_1.bmp	1	2	726	2.915465	6	
1	Var_1	D_SF_3-5666_1.bmp	1	3	590	0.506278	9	
1	Var_1	D_SF_3-5666_1.bmp	1	4	774	0.253462	11	
1	Var_1	D_SF_3-5666_1.bmp	1	5	217	5.181109	5	
1	Var_1	D_SF_3-5666_1.bmp	1	6	206	7.53275	3	
1	Var_1	D_SF_3-5666_1.bmp	1	7	737	0.292258	10	
1	Var_1	D_SF_3-5666_1.bmp	1	8	622	47.83393	1	
1	Var_1	D_SF_3-5666_1.bmp	1	9	791	0.207555	13	
1	Var_1	D_SF_3-5666_1.bmp	1	10	223	23.855216	2	
4		D. OF 0 5000 41			700	0.005070	LOOK	b b
			aft	er	Color	tł	he lahel is a	habbe

AIM14_RESULT_CELLU	JLE_IMG [583]		ane		COIOT		the	abel is added	
OBJECT_NUMBER 🔍	OBJECT_NAME	IMAGE_NAME	LINE 🔍	COLUMN (RHS_gm	♥ Pixel_%_RHS	Rang Couleur RHS	Label RHS_grp [En]	8
1	Var_1	D_SF_3-5666_1.bm	1	1	746	0.241177	12	Moderate Purplish Pink [186D]	-
1	Var_1	D_SF_3-5666_1.bm	1	2	726	2.915465	6	Dark Yellowish Pink [181D]	1
1	Var_1	D_SF_3-5666_1.bm	1	3	590	0.506278	9	Moderate Yellowish Green [147D]	
1	Var_1	D_SF_3-5666_1.bm	1	4	774	0.253462	11	Pale Yellowish Green [193D]	
1	Var_1	D_SF_3-5666_1.bm	1	5	217	5.181109	5	Strong Pink [054C]	
1	Var_1	D_SF_3-5666_1.bm	1	6	206	7.53275	3	Moderate Pink [051D]	
1	Var_1	D_SF_3-5666_1.bm	1	7	737	0.292258	10	Moderate Purplish Red [184C]	
1	Var_1	D_SF_3-5666_1.bm	1	8	622	47.83393	1	Yellowish white [155D]	
1	Var_1	D_SF_3-5666_1.bm	1	9	791	0.207555	13	Grayish Yellowish Green [198A]	
1	Var 1	D SE 3-5666 1 hm	1	10	223	23 855216	2	Pale Pumlish Pink (056A)	٠,
◀									

Reminder: Not all languages are available with regard to color classes.

5.6 – Species – Individual - Company (Non GEVES)



This window enables you to manage the species, individuals and companies used in the AIM application. By default, this window is hidden from GEVES users, who benefit from centralized management of species, individuals and companies.

<u> </u>	acro <u>F</u> ast Processing	Processing Software	<u>R</u> eferential	<u>O</u> ptions	Window	<u>H</u> elp		_ 8
ք 🗢 🗢 🖻	2003	+ 🖂 🖃 🖻 🖻	1 📧 🖭 🗹	1 🖸 🖉				
💭 Species 🤶 Indiv	viduals 🚷 Companies							
C53_C_ESP	 Q\ [‡]		C53_V_NOM_ES	P			٩	1
0	Espece inconnue							1
40 500	Maïs							
40 551	Betterave							
40 703	Orge							
40 757	Colza							
40 770	Tournesol							
40 801	Blé							
40 810	Laitue							
40 839	Tomate							
41 030	Pêcher							
42 068	Nectarinier							
		nt field = ColTab_C53_V_N					2/2014	16:49:53

5.6.1 – Consultation

The three tables are split into three tabs.

5.6.2 - Create / Modify

In order to add a new entry, place the cursor on the last row and type in the entry field. The codes used should be unique and the labels should be non-zero.

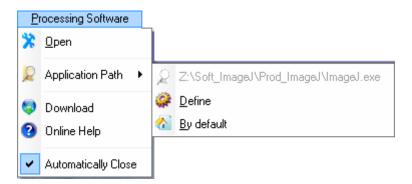
Note: for individuals, the ACTIVE (Y = yes, N = no) column enables the individual to be masked or displayed in the input windows. The same applies for companies.

5.6.3 – Delete

To delete an entry, select it and click on the 📃 button.

Note : If an individual or company is no longer valid, it is preferable to deactivate it rather than deleting it.

6 – "Processing Software" Menu



6.1 – Open

"Open" enables you to launch the image-processing software.

6.2 – Application path

"Application path" enables you to consult the executable file path (in grey) as defined on your computer.

6.3 – Define

"Define" enables you to select the executable item (path and name of third party software).

6.4 – Default

"Default" enables you to select the executable file path by default, as defined by the IT service of your company. It is stipulated in table STD_IDENTIFIANT.

6.5 – Download

"Download" enables you to open the "ImageJ" software website directly on the <u>downloads page</u>. <u>http://rsbweb.nih.gov/ij/download.html</u>

6.6 – Online support

"Online support" enables you to open the "ImageJ" software website on the homepage. <u>http://rsb.info.nih.gov/ij/index.html</u>

"Online support for macros": http://rsb.info.nih.gov/ij/developer/macro/functions.html



6.7 - Close automatically



"Close automatically" is an <u>option</u> for automatic closure of the image-processing software when it is opened in the "Analysis" and "Quick Processing" windows.

7 – "Quick processing" Menu

7.1 – Quick processing

As its name suggests, this window enables you to process a series of images quickly. The study declaration and integration of results stages are bypassed (although they can still be accessed if necessary).

💩 AIM - Managing image processing and analysis - [Process]	x
💩 Eile <u>S</u> tudy <u>M</u> acro <u>F</u> ast Processing Processing Software <u>R</u> eferential <u>O</u> ptions M <u>o</u> dule Wi <u>n</u> dow <u>H</u> elp	. 5 ×
📓 🖙 🗢 🔹 💈 🔊 🗳 🛱 🛋 🚍 🖉 🔝 🕼 🧭 📅 💕 List of macros [31]	
Load (Dir.) Remove Label Study Fast processing Name Contact Descrip Establish	
Load images Choose a macro Start analysis DECOUPER - Formet (manuel) STANDARD - tous types dimage vers un type provide the cellules COMPTER - Cellule STANDARD - compte le nombre de cellules COMPTER - Jeune Pousse JMR - compte de découper une partie de DECOUPER - Formet de découper une partie de DECOUPER - Vertical ou Horizontal (auto) BAG - permet de découper les images automatiq DEFINIR - l'áchelle Pixels - Milimètres STANDARD - Calcul du rapport Pixels / Milimètres	MO RE' MO MO MO
Current DataBase = Ange_Adre (User = moutaultb) Current field = ColTab_A03_A_CONTACT_NOM 04/02/2014 17:06:32	

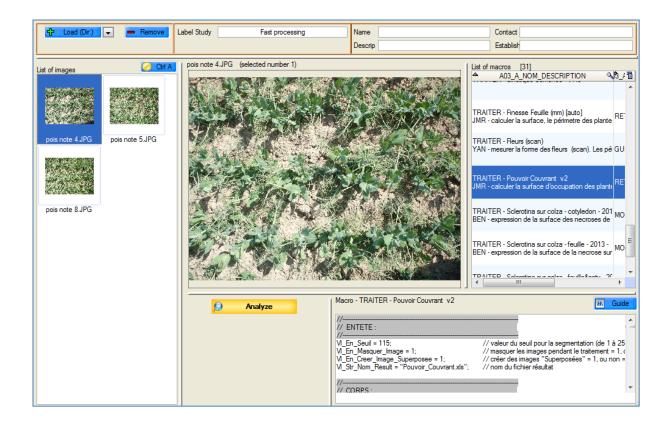
You can also open this window with the button



from the window MAIN.

7.1.1 – How to use this feature

When the window opens, AIM automatically launches a study. All you need to do is to: upload the images; select a macro; launch the analysis.



7.1.2 - Study

Every time the window is opened, a new study is automatically created under the heading "Undefined" with the name "Quick processing" (which you can modify). This enables you to save all the processing operations performed through the AIM application.

Label Study	Fast processing

7.1.3 - Images

To upload the list of images, use the **toad (Dr.)** button. An options window will allow you to upload all the images contained in a directory.

You can also upload images by selecting them directly. To modify the subtron option users must move from /*Directory* to *File*, then use the Add (Fil.) button.

÷	Load (Dir.)	-
		Directory
		File

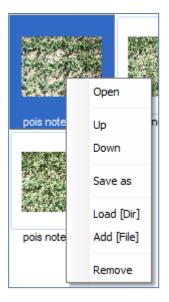
In order to remove one or more images from the list, you must select it/them and then click on the **Remove** button.

The Ctd A button enables you to select the complete list of images (select/unselect).

A pop-up menu is available for this list of images. Rightclick to call up the pop-up menu.

Open : enables you to open the first image selected

Move up/Move down: enables you to change the order of the images in the list
Save as: enables you to choose a directory in which to save the selected images.
Upload [Dir]: see above
Add [File]: see above
Remove: see above



7.1.4 – Macros

The list of macros is loaded automatically; you can filter it with the aid of input fields: Name, Description, Contact and Establishment.

Name Descrip	Contact
Descrip	Establish

Reminder: Use the "%" symbol to search the names which *start with* or *contain* the text entered.

 Example: to only see macros that contain the word "process" in their name, type

 "%process%" and refresh the list (exit the field).

 Name
 %traiter%

 When you select a macro, the text appears in the

 "visualization" field.

// CORPS

It is possible to make temporary modifications.

These changes are saved until the list is refreshed, even if you change the macro.



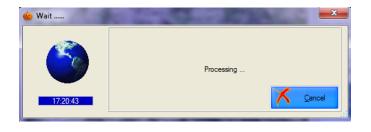
7.1.5 – Analysis

When you have selected the images and the macro, you need to launch the analysis by clicking on the Analyze button.

A stand-by window appears while the images are being processed by third party software.

If processing is not completed, you must inform AIM that it is to be

cancelled, using the Annuler button.



The AIM application detects when processing is completed and automatically brings up the images and results files (provided in the "Macro management" window). The new images will be uploaded to the list and the processing history updated. You can view the

	results files, using the	-	View Result	button.
--	--------------------------	---	-------------	---------

	Analyze
List the processing and result 12_D_DATE_TRAITEMENT	
12/06/2012 15:28:16	Pouvoir_Couvrant xls.zip
12/06/2012 15:09:29	Pouvoir_Couvrant.xls.zip
	-
🍪 Vi	ew Result

The "Integration" window opens and you will be connected back to AIM in its normal functioning mode AIM (§ 9.3).

8 – "Macro" Menu		
	Macro	

8.1 - Management of "Macros"

In the AIM application, images are processed with the aid of external software (third party): for example, Image-J (selected by GEVES for its community and freeware character).

AIM runs Image-J with the help of **macros** that can be managed from this window.

à 😧	IM - N	lanaging in	nage proce	essing and analysis	- [Management	of Macros]							
è	<u>F</u> ile	<u>S</u> tudy	<u>M</u> acro	East Processing	<u>P</u> rocessing So	/ftware <u>R</u>	eferential	<u>O</u> ptions	M <u>o</u> du	le Wi <u>n</u> dov	v <u>H</u> elp		- 5 >
	(\$	2	0 0 🕥	t 🔏 🗖	ا 🛃 🕒	💶 💽	2 🗖 🖉					
-Search Criteria (You can use the %)													
Nar	ne		De	scription		Contact Nam	ne		Establish	ment		🔽 Valid	
iet o	fmacm	os [31]								View			
	MAC		A0	3_A_NOM	¢.		A03	A DESCRIP	i 🖬 10IT	//			/
	·]	COMIT	En - Jeune -	rousse		iprage de jeun	ies pousses	avec seurna		// ENTETE:	:		
				non sur Feuille		ression de la s					de = "Huang";		// autre ^E
		TRAITE				ures longueur:	-			V_En_Cache	r_lmage = 1;		// renc
1		SOUST				ormise le fond (· · ·		VI_Bo_Imag_	Superpose = 0;		// cree
1	06	MESUR	ER - Mm - S	urface Cotylédons	PATHO - r	nesures surfac	e cotylédon:	(en mm) sur t	able	11			
50	086	DEFINIF	R - l'échelle l	Pixels - Millimètres	STANDAF	RD - Calcul du	rapport Pixe	ls / Millimetre	s	// CORPS :			
4	19	COMPT	ER - Cellule		STANDAF	RD - compte le	nombre de	cellules		//			
1	16	MESUR	ER - GEVES	5 - Analyse_Objet	STANDAF	RD - mesures (GEVES-Ana	lyse_Objet) si	ur gra	// verification	version minimum	n IMAGE Jet optio	on standar
1	36	BINARI:	SER - Simple	;	STANDAF	RD - méthode s	simple + seu	l automatique	e = 'F	//			
1	17	OUVRIF	R - Image		STANDAF	RD - ouvre dan	ns le logiciel	de traitement	les ir	requires("1.44	lp"); ", "iterations=1 o	ount=1 "\-	
50	091	AJUSTE	R - Contrast	e	STANDAF	RD - permet d'a	ajuster auton	natiquement le	e cor	run("Colors'	. "foreground=bla	ack background=1	white sele
50	090	DECOU	PER - Forme	es [manuel]	STANDAF	RD - permet de	- découper v	ne partie de l	îmac	//			
5	55		- Film		STANDAF	RD - Présente I	les images e	n stack (film)	-	// voir ou nor	n les images		-
4	10	MESUR	ER - Pixel			RD - Surface, p	-		, lon	setBatchMod	e(M_En_Cacher_	Image);	
		CHANG				RD - tous types		-		//			
		✓ INVERS		r		RD - tous types	-			// ren:	seignements sur t	ous les fichiers	
_	-	BINARI				a, cotylédons	-			VI En Nombr	e Fichier = VI Ta	ab Images.length;	
		_			1744 6012	a, cotyleaona	- methode a	imple, seai na			hra Fichier 0		
•		i	11						•	[S_*.*:SC][NB	**.NID1		- P
				😺 Export	🛃 Import			View [Text]			ivbj		
_	list of r	macros whic	h it denende	[0] List of ma	cros that use [0	1							
			in a depends	••		1	A						_
403	B_MACI		_	A03_A_	NOM		<u>्</u> स्	N_ORDRE_I	DEPEND	ANC®, [‡] Level	4	1	û 🗘
												*	Į -
urren	nt Datal	Base = Ange	_Adre (User	= moutaultb) Curre	ent field = Ong List	e_Macro					04/02/2014	17:32:23	

Reminder: A macro is a scripting language which enables you to automatize a sequence of actions. Macros are saved under the file format TXT (text). The Image-J software has a save function to record actions performed ("record"), which renders the process of writing macros more simple.

8.1.1 – Consulting a macro



When selecting a macro (in the main table), you can consult the list of macros containing that macro (in the details table). The macro text (in RTF) will be shown in the right hand part of the window (but cannot be modified here).

Using the View [Text] button, you can open the macro in a text file (the default program in this case is "Bloc-Notes"), without RTF formatting.

8.1.2 - Create / Modify a macro

To open the window to create a new macro, use the shortcut key [F10] or click on the button.

🎃 Adding a new macro).						
Name	acro contains a part DESCRIPTION :		V	alidity 🔽	Online Help		
	ates that the creator (group) and the op	eration of the macro.					
MACRO	DESCRIPTION	PLANNING					
Header	Reminder: Automatic Header						
Each AIM macro contai	ins a part HEADER :						
- which indicates variab	les and values, easily understandable b	by the user.					
Macro body							
Each AIM macr	o contains a part BODY :						
- which uses variables of	f the AUTOMATIC HEADER and of the	HEADER					
-that checks the version	n and options of image processing soft	vare					
- that tests the image list	- that tests the image list. Because if it's empty, it must update : if (V_Tab_Images.length == 0) {V_Tab_Images = getRileList(V_Str_Repsource); }						
- which loops on the ima	ge list of the source directory (M_Str_R	lepsource)					
- that records images and results in the destination directory (V_Str_Repdestina)							
Each AIM macro contai	ins a part OUTPUT : that describes th	e elements to record at the	end of your analysis.				
\$	Name 🔍 🗘	What 🔍 🕈	Type ୣୣ	Caption	21		
•	Resu	lt File 💌			Î Î Î		
		Save	ĺ	Close			

Likewise, to modify a macro, select a row and use the shortcut key [F11], or click on the \bowtie button, or double-click on the row.

🎃 Changin	g the macro,	n° 9 - 36	j	-	_					Ŀ		x
Name	BINARISER -	Simple						Validity	V		Online	Help
Description	STANDARD -	méthode	simple + seuil a	automatique	= 'PNG'							
N	IACRO		DESCRIPTIO	N	F	LANNING						
	Header	Re	minder: Automa	atic Header								
V_En_Ca	M_Str_Methode = "Huang"; // autres valeurs possible : "Default" M_En_Cacher_Image = 1; // rendre le traitement caché = 1, ou non = 0 M_Bo_Imag_Superpose = 0; // creer des images couleur pour vérifier binarisation = 1, ou non = 0											
Macro bod	/											
// // verifica	tion version mi	nimum IM/	AGE J et option	standard =	 ⊧> le fond es	t BLANC,						
requires("1 run("Option run("Colors	.44p"); ns", "iteration ", "foregrour	ns=1 coun nd=black t	t=1 "); background=wl	hite selectio	 n=yellow'');							≡
	non les image	s										
	ode(M_En_Ca	cher_Ima	ge);									
	enseignement	s sur tous	les fichiers									
	mbre_Fichier = lombre_Fichier		mages.length;									
}	VI_Tab_Image: VI_En_Nombre	s = getFile _Fichier =	List(M_Str_Rep M_Tab_Image	osource); es.length;								
	nitialise les fom	nats de fic	hiers images a	ccepté	τ							
M_Tab_lm M_Tab_lm M_Tab_lm M_Tab_lm M_Tab_lm	//											
V_Tab_Im	age_Format[3] age_Format[4] nbre_Image =	= "gif";										-
	macro contain	is a part O	UTPUT: that					l of your a	analysis.			
≑ S_*.*	Nan	ne	٩			Type SC	Q ,≑		Caption	٩ 🖬		
S NB_**				lmage Image	Ŧ	NB		erposée - et Blanc	Couleur		J	
					Save				Close		_	

In addition to the macro text, you can enter a variety of information relating to the macro (description):

- Name
- Description
- Validity
- The person (responsible for the macro)
- Their e-mail address
- Their telephone number
- Their company name
- And a mini macro user guide (explaining its aim, general function, displaying the images expected on entry and those produced on exit, explanations of certain variables, ...)

	Name	BIN	ARISER	Simple	Validity 🔽	Online Help				
/	Description	STANDARD - méthode simple + seuil autematique = 'PNG'								
_		MACI	RO	DESCRIPTION	PLANNING					
~	Person	9	790	MOUTAULT	Benjamin	× 🗔				
_	Email	Email benjamin.moutault@geves.fr								
_	Phone	Phone 02.41.22.86.35								
_	Establishm	Establishment Groupe d'Etude et de Contrôle des Variétés et des Semences								
g 🛶	MS Shell [-	▼ 8	▼ 🗭 B I U abe 🖊 ▼ A	▼ ■ ■ ■ ×					
5 7	Cette ma	acro	permet	de binariser des images.						
n	Les objets sont de couleurs foncés sur un fond blanc (rétro éclairé)									

Comment: it is important to be precise concerning labels, as this will make searching easier and improve the readability and sorting of macros.

In the first tab, labeled "MACRO", the macro is divided in 3 parts:

Header	
VI_Str_Methode = "Huang"; VI_En_Cacher_Image = 1;	<pre>// autres valeurs possible : "Default" // rendre le traitement caché = 1, ou</pre>

It is necessary to obtain the fixed values and parameters for the various commands used from your macros. This information must be entered into the variables, in order to clarify their use for users unfamiliar with the set-up, and to facilitate the temporary modification of macros while they are running.

Macro body	
// // verification version minimum IMAGE J et option standard =: //	>
requires("1.44p"); nup("Options " "iterations=1.count=1.");	

the BODY

Enter the macro process into this part, taking care to use the variables in the HEADER and the AUTOMATIC HEADER. This part enables you to format the text into RTF, in order to increase the readability of the macro (e.g.: add colors to the comments).

Each A	AIM macro contains a part	OUT	PUT:	that d	descri	bes the ele	ements to record at the en	d of your	analysis.
ŧ	Name	0	ŧ	What	٩	🕈 Type 🔍	Caption	٦	_
S_**			lmage		T	SC	Superposée - Couleur	*	
NB_*.*			Image			NB	Noir et Blanc		

the OUTPUT

To finish, you need to enter data into the "OUTPUT" part, which defines the elements that need to be recorded to end the processing operation (images, files, output files).

There are three elements available:

Result file:

enables you to save all files (measurements and others) generated by the macro and the image-processing software in the following table: AIM16_FIC_RESULT_TRAITEMENT. The files will appear in the "Integrate" window and will be available for integration into the database.

<u>Image:</u>

enables you to save all images (segmented, superimposed/layered, etc...) in the table AIM13_IMAGE. The images will be available for new processing operations in the "Analysis" window.

File:

enables you to save all files (traceability, additional information) in the table AIM25_FIC_DIVERS_DESC). The files will be available for new processing operations in the "Analysis" window.

You can change the order of the "outputs" 🚺 🚺 and delete them 💻

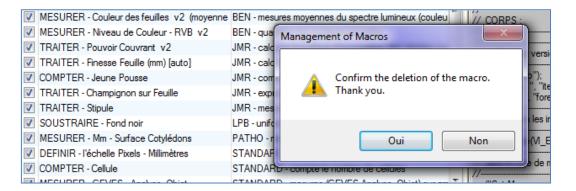
Example: for a macro that generates a number of results files in Excel format and binary (black and white) images, with names ending in "_NB", the output section should be set up as follows :

ŧ	Name	∿ ‡	What	٩	🕈 Type 🔍	🕈 Caption ଏ
*.xls		Resul	t File	•		
_NB.		Image	e .		NB	Noir et Blanc

Then click on the Save button to save the macro and click on the Close button to close the window.

8.1.3 – Deletion

To delete a macro, select it and click on the **b**utton, or use the shortcut key [F12], and confirm the deletion.



8.1.4 - Import / Export

You can import or export macros into and out of the AIM application, for example, to facilitate the exchange of macros between users in different organizations and companies. Each macro has a corresponding file (a Word file (*.doc)).

Exporting macros

Select the macros, click on the *seport* button and indicate the destination directory.

Importing macros

Click on the **mont** button and select one or more "Macro" files (Word files).

Caution: if other Word documents are open, they will be closed automatically.

Example: to work out the expected AIM format for importing macros, use the example file,

by pressing the 2 button.

AIM - gestion des macros (Fichier d'import / export) NOM • DESCRIPTION ENTETE CORPS * RETOUR CONTACT_NUM CONTACT_NOM; AIM - gestion des macros (Fichier d'import / export) NOM * RETOUR CONTACT PREN TRAITER - Pouvoir Couvrant [*.xls][5_*.*5] DESCRIPTION CONTACT_NUM CONTACT EMAI JMR - calculer la surface d'occupation des plantes (couleur verte) par rapport au sol (en champs) 02413 ENTETE CONTACT_NOM * CONTACT_TELEP VI., En., Sewil = 115; // seuil pour la binarisation RETAILLEAU VL.En_Cacher_Image = 1; // rendre le traitement caché = 1, ou non = 0 VL_En_Creer_Image_Superposee = 0; // créer des images "Superposé" (fait resortir les zones CONTACT_PRENOM mesurées) = 1, ou non = 0 CONTACT_ETAB Jean-Michel VI_En_Mesure_Mini = 150; // taille (pixel) minimum des cellules mesurables <u>VL_Str_Nom_Result</u> = "Pouvoir_Couvrant.xls"; // nom de sortie du fichier de mesures CONTACT_EMAIL USER_GUID jean-michel.retailleau@geves.fr CORPS * un("Set Measurements...", "area display redirect=None decimal=1"); CONTACT_TELEPH Medaration et initialisation de variables M.St. Image. NO.Lettre = "NB_1"; // M.St. Image. NO.Lettre = "NB_1"; // M.St. Image. NO.Lettre = "por"; // M.St. Image. NO.Lettre = "por"; // M.St. Image. Noverspec. Lettre = "por"; // M.St. Col.St. Elan = "Plant Area"; // M.St. Col.St. Elan = "Plant Area"; // M.St. Col.Env. Court, = "Covering Power 5;"; // préfixe les noms d'images passées en Noir et Blanc
// préfixe les noms d'images avec l'info qui ressort 02.41.57.09.91 Pour utiliser ce fichier, vo // format de sortie des images Si vous avez plusieurs ma // format de sortie des images CONTACT_ETABLISSEMENT // titre de la colonne Merci, bonne journée. Groupe d'Etude et de Contrôle des Variét // titre de la colonr verifie presence des fichiers "En Nombre, Eichier - W. Tab. Images leng M. En Nombre, Eichier - 0 M. Jab. Images - peficielia(M.Str. M. En Nombre, Eichier - M. Teb. Im USER_GUID Le but de la macro est de calculer la surface La macro attends des images de type could Photos prisent en champ, a hauteur d'ho boucle sur tous les fichiers for (j=0; j<M.En.Nambre.Eichier: j++) // applique un filtre (RVB) ne garde que le plan BLEU // sépare couleurs, passe en noir et blanc et ré-attypu so call("iudupin/same.Color.Taxasholder.RGBtolath"): run("RGB Stack"); run("Convert Stack to Images"); run("Convert Status to Images); septext/lightan("Green"); setThreshold(VLEG_Seuil, 255); run("Convert to Mask"); (grogon(NLMSs_Jonge_NB_Legge + VLSs_Image_Nem_Complet); VLSs_Image_Nem_NB = getUde(); // mesure la surface noire (les plantes) et efface manuellement les valeurs run "Analyze Particles...", "size=" + 10.50.Mesure.Mini, + "-Infinity circularity=0.00-1.00 10 3 , U.deleteRows(/M_En_Nombre_Image-1), (M_En_Nb_Result-1)); mesure de la surface totale de l'image et calcul du rapport (arrondi) 10 ("mesure de la sufface totale de l'image et calcui du rapport (a cun ("Messure") : M. En. Suct. I = getResul(("Ares", (M. En. Nombre, Image 1)) ; M. B. S. Suct. Pourt. = (M. En. Suct. P. 1000, (M. En. Suct. T. Vous pouvez faire varier le seuil pour la bi

Below are 2 example files: one empty and the other one already filled out.

Authors : B. Moutault & C. Chevalier Date : 20/08/2012

Page 46 Version 1

9 "Study" Menu



9.1 – Study declaration

Before processing images, you need to define the operating environment.

This window enables you to create and manage the declarative aspect of studies, which includes information such as the name of the study, experimental conditions, study materials (varieties), the number of replications, usable macros, acquisitions, zone layout (varieties) on the images of the acquisitions, etc.

<u>F</u> ile	<u>Study Macro</u> East Processing	Processing Software	<u>R</u> eferential	<u>O</u> ptions M <u>o</u> du	le Wi <u>n</u> dow	<u>H</u> elp	-	5
1 📼	🗢 🗢 🖻 🗿 🔊	🛨 🚄 💻 🖆	1 💷 🖭 🕻	2 🗖 🖉 🔽				
earch Crit	teria (You can use the %)							-
уре	 Name 	Species					<u>N</u> ext	0
of studie		a 🛱			a 🖨		- #	
C_ETUR			LIBELLE				A07_NUM	NR.
2	Couleur des Fleurs (Orchidées)	Exemple		Groupe d'Etude et		Benjamin	1	
5	Test Couleurs RHS	Phase de test		Gip Geves	MOUTAULT	Benjamin	1	
7	Traitement Rapide d'une fleur	Démonstration			CHEVALIER	Christophe	1	
8	2012 - Projet SCLEROVAR - feuilles de cola			CETIOM	MOUTAULT	Benjamin	1	
12	Couleur des Feuilles	Exemple		Groupe d'Etude et		Benjamin	1	
13	Finesse des feuilles	Exemple		Groupe d'Etude et		Jean-Michel	1	
14	Etude Syngenta Mai's 2009	SNES - Phénotypag			DEMILLY	Didier	2	
15	Métrologie des bancs - COLZA	SNES - Phénotypag	je	Groupe d'Etude et	d DEMILLY	Didier	2	
17	Comparaison Couleur Appareil Photo	Coloration		NAKTUINBOUW	MOUTAULT	Benjamin	1	
38	Expression BioAgresseurs sur Feuille	Exemple		Groupe d'Etude et	d CADOT	Valérie	1	
40	Dénombrer des plantes (jeunes)	Phase de test		Groupe d'Etude et	d RETAILLEAU	Jean-Michel	1	
41	Distinction de Grains (Mai's)	Exemple		Groupe d'Etude et	d MURACCIOLE	Vincent	1	
42	Mesure OCVV sur Cotylédon	Exemple		Groupe d'Etude et	d GUICHETEAU	Yan	1	
40	<u> </u>		1	- ID -	DETAILEAU	1. 16.1.1	-	Þ
			1					
Material	Acquisition Macro							
		û U⊳ Ē D	lown 🕄 F	Refreshes	Add 🔧	Modify All	Delete	
	uisitions [10]		atta	A			Delete	
ACQUIS	av [∉] A02_A_NOM	D_DATE_ACQUISIT		M 🔍 🖗 A05_A_NO	M 🍳 🛱 A05_A_LOC	ALISATION S		1
34	Var_2501	24/10/2012	Scanner	GEVES				-
35	Var_2502	24/10/2012	Scanner	GEVES				
36	Var_2503	24/10/2012	Scanner	GEVES				
37	Var_berlikumer	24/10/2012	Scanner	GEVES				
38	Var_blanche a col	24/10/2012	Scanner	GEVES				
39	Var_bolero	24/10/2012	Scanner	GEVES				
40	Var_de colmar b	24/10/2012	Scanner	GEVES				
41	Var_soprano	24/10/2012	Scanner	GEVES				
42	Var_touchon	24/10/2012	Scanner	GEVES				
	 Var_valor	24/10/2012	Scanner	GEVES				
43								



9.1.1 – Consultation

Using the "Search criteria" bar, the list of studies can be filtered by study type, name of study and by species (code and label).

-Search Criteria (1	You can use the %)		
Туре	Name	Species	

When selecting a study (in the main table) it is possible to consult:

- the list of materials (in the details table, in the "Materials" tab).

- the list of acquisitions (in the details table, in the "Acquisition" tab).
- the list of macros (in the details table, in the "Macro" tab).

9.1.2 - Create/ Modify

To open the window to create a new study, use the shortcut key [F10] or click on the button.

🎃 Adding a n	ew study.				
Type of study	Exemple				I
Name					
DUS Species					X 🖸
Establishment					X 🖸
Person					X 🖸
Date of Receip	t [3	1 Addr	essing (define default values))
Desired Date of	fRetum	3	1		
Number of repe	tition of objects	1			
Zone layout	Unique)			•
Theoretical con	dition				× 🗔
				Display	details conditions
Description					
	-	ОК		Close	

Similarly, to modify a study, select a row and use the shortcut key [F11], or click on the \bowtie button.

💩 Modification of the study, n° 4	4 - 13		<u> </u>				
Type of study Exemple			•				
Name Finesse des feuilles	nesse des feuilles						
DUS Species 40811 Carotte		× (ī				
Establishment 0 3325 Grou	pe d'Etude et de Contrôle	e des Variétés et de Brion, SEV	•				
Person 0 2413 RET,	AILLEAU	Jean-Michel	•				
Date of Receipt	24/10/2012 31	Addressing (define default values)					
Desired Date of Return Number of cells per Line (by Zone) 5							
Number of repetition of objects	1	Number of cells per Column (by Zone) 2					
Zone layout Uniqu	e		•				
Theoretical condition		× 1	•				
		Display details conditions					
Description Mesurer la surface e finesse des feuilles.	t le périmetre des feuilles	de carotte et calculer leur rapport. De facon a exprimer la					
	ОК	Close					

Indicate <u>the **study type**</u>, its <u>name</u>, species, establishment and person requesting the study, the receipt and return dates and the number of replications for the objects/materials/varieties to be used in the study. It is necessary to define <u>the layout</u> (number of zones), as well as the number of cells per row and per column (if you know the indexing of your image series) and the list of theoretical conditions. A description field enables you to save comments and enter additional information.

The use of bold and underlined text is a reminder of the important fields that must be indicated.

9.1.3 – Deletion

To delete a study, select it and click on the **b**utton, or use the shortcut key [F12], then confirm the deletion.

Caution: Studies selected for deletion should not have any images or processing operations attached to the acquisitions.

9.1.4 - Materials

This list enables you to declare the material to be studied. The word "material" covers varieties, batches of seeds, or any other object to be studied (species, individuals, galaxies).

ist of materia	[10] 📐 [mport] 🧽 Examp	le Liste Cultivar	Create Acquisitions (fro	om the selected material)
_C_OBJE®			A204_A_LIBELLE	1
	Var_2501	CULT Cultivar		
2	Var_2502	CULT Cultivar	2	Refresh order
3	Var_2503	CULT Cultivar	3	
4	Var_berlikumer	CULT Cultivar	4	
5	Var_blanche a col	CULT Cultivar	5	🕂 Add
6	Var_bolero	CULT Cultivar	6	Ohi
7	Var_de colmar b	CULT Cultivar	7	Obj_
8	Var_soprano	CULT Cultivar	8	+ increment
9	Var_touchon	CULT Cultivar	9	Type NDEF
10	Var_valor	CULT Cultivar	10	
10	Var_valor	CULI Cultivar	10	- Delete

Click on the Add button to create new rows. You have default access to the label, which is accompanied by a number incremented (which is the highest object number), as well as the type of material used.

Variety_	
+ incre	ment
Type NDEF	.
NDEF	Non défini
SEM	Lot Semence
SER	Série
VAR	Variété

Double click on the row or on the \bowtie button to modify the material.

Var_2502			CULT	Cultivar
Var_2503			CULT	Cultivar
Var_berlikumer (Modification	of study material	Contract of Contract	- 0 - X -
Var_blanche a col		an study matchar	1000	
Var_bolero	For the study : Fine	esse des feuilles		
Var_de colmar b				
Var_soprano	Material Caption	Var_2503		
Var_touchon				
Var_valor	Serv & Code	0 3		
	Type of object	Cultivar		•
e = Ange_Adre (User =		ОК	Close	
Var_de colmar b				
	Delete 1			
lick on the 📕	buff	on to delete the m	aterial	

You can manage the order of the materials you declare in the study using the 1

button to delete the material.

Refresh order buttons to move material up or down. The button reshuffles the order according to the filter in place. The order is important when automatically creating acquisitions, loading images automatically, etc.

Click on the

You can import data from an Excel file (using the **button**), while respecting the column order on the first page:

	A	В	С	D
1	TYPE_OBJET	SERV_OBJET	NUM_OBJET	LIBELLE
2	NDEF	9	1	Variété_1
3	NDEF	9	2	Variété_2
4	NDEF	9	3	Variété 3
5	NDEF	9	4	Variété 4
6	NDEF	9	5	Variété 5
7	NDEF	9	6	Variété 6
0				_

To see an example file, click on the **Example** button.

The Create Acquisitions (from the selected material) button will automatically

generate acquisitions in accordance with the material selected (the order) and the number of replications declared in the study record.

Example: There are three varieties and two replications. Six acquisitions are to be created. The following options are available for the creation order:

Either by replication

Variety_1 - replication_1 Variety_2 - replication _1 Variety_3 - replication _1 Variety_1 - replication _2 Variety_2 - replication_2 Variety_3 - replication _2 Or by material

Variety_1 – replication _1
Variety_1 - replication _2
Variety_2 - replication _1
Variety_2 - replication _2
Variety_3 - replication _1
Variety_3 - replication _2

9.1.5 – Acquisition

"Acquisitions" are the "directories" of the study. This concept is important, as each acquisition will contain images, measurement files, processing history and study results.

Various data need to be entered for each acquisition, such as the layout and description of materials (their arrangement in the image series), the conditions in which the images were acquired, the image source, the date they were acquired and a target directory for automatic image retrieval (optional - § 9.2.2.b).

Material	Acquisition Macro		
List of acqui		Up 🖡 Down 📸 Refreshes 🔂 Add 🏷 Modify All 💻 Delete	_
CQUIS	🕈 A02_A_NOM 🍳	D_DATE_ACQUISITIN A AD4_A_NOM A AD5_A_NOM A AD5_A_LOCALISATION A	1
34	Var_2501	24/10/2012 Scanner GEVES	*
35	Var_2502	24/10/2012 Scanner GEVES	
36	Var_2503	24/10/2012 Scanner GEVES	
37	Var_berlikumer	24/10/2012 Scanner GEVES	
38	Var_blanche a col	24/10/2012 Scanner GEVES	
39	Var_bolero	24/10/2012 Scanner GEVES	

To add, modify or delete, use the P A = buttons. To modify more than one acquisition, use the Modify Al button. You can also manage the order of acquisitions with the Up J Down Refresh Order buttons.

	y : Etude Sy	ngenta Maïs	2009		
Name	Test_Sé	rie_1		Date	25/10/2010 31
Support	Cam_1			 Source 	Banc_1
Images direc					
List of condit	ions [6]				
	200_A_LIBE	LLE	S_N_VAL_CON		
Fréquence			2	en heure	✓ ^
Grossisseme Image référe			3.7	pixel par millimetre	
Nombre Cell			5		
Nombre Cell			10		
Seuil déplac	-	e	0.3	en millimetre	
Seuli depiac	emeni		0.5	en millimetre	×
Materials of a	acquisition	[4]	0 # 432 A I		
Materials of a	REA CEA	VRA23_OB			
ZONE® M_F	REQ. <u>F</u> OEQ. 1 4	VRA23_OB	Sem_1	Lot Semence	0
20NE ^Q M_F 1 2	RE ^Q ∲_OEQ 1 4 1 4	VRA23_OB 1 2	Sem_1 Sem_2	Lot Semence Lot Semence	0 ^
20NE® M_F 1 2 3	REQ <u>F</u> OEQ 1 4 1 4 1 4	VRA23_OB 1 2 3	Sem_1 Sem_2 Sem_3	Lot Semence Lot Semence Lot Semence	0 1
20NE® M_F 1 2 3	RE ^Q ∲_OEQ 1 4 1 4	VRA23_OB 1 2	Sem_1 Sem_2	Lot Semence Lot Semence	0
20NE® M_F 1 2 3	REQ <u>F</u> OEQ 1 4 1 4 1 4	VRA23_OB 1 2 3	Sem_1 Sem_2 Sem_3	Lot Semence Lot Semence Lot Semence	0
20NE® M_F 1 2 3	REQ <u>F</u> OEQ 1 4 1 4 1 4	VRA23_OB 1 2 3	Sem_1 Sem_2 Sem_3	Lot Semence Lot Semence Lot Semence	0
20NE® M_F 1 2 3	REQ <u>F</u> OEQ 1 4 1 4 1 4	VRA23_OB 1 2 3	Sem_1 Sem_2 Sem_3	Lot Semence Lot Semence Lot Semence	0
20NE® M_F 1 2 3	REQ <u>F</u> OEQ 1 4 1 4 1 4	VRA23_OB 1 2 3	Sem_1 Sem_2 Sem_3	Lot Semence Lot Semence Lot Semence Lot Semence	
20NE® M_F 1 2 3	REQ © OF 1 1 4 1 4 1 4 1 4 2 Zone	VRA23_OB 1 2 3 4 HG	Sem_1 Sem_2 Sem_3 Sem_4	Lot Semence Lot Semence Lot Semence	

Enter the name, date and medium used to acquire the images, as well as the directory in which they are saved because, when first launched, AIM will load the images automatically.

The list of conditions is (by default) the same as that of the study, but you can modify it by entering values and comments directly into the table. Add and remove rows using the buttons. The checkbox (last column) enables you to enter the conditions in the "calculations" window and is designed to describe as accurately as possible the image or images relating to this acquisition.

The list of materials works the same way. The aim is to describe as accurately as possible the image or images (and their zones) relating to the acquisition, so that your results can be directly linked to the materials (objects, varieties, ...). This list makes such a match possible.

For each row, fill in the zone and replication, as well as the set up period, if you have time differences between seed lots (for example).

9.1.6 - Macro

The list of macros is used to define those macros that will (or that can) be used in the study.

st of macro		0, †			2		📧 Guide
RA03_M/%				ARE_DA	1		
17	OUVRIR - Image	ST	ANDARD - ouvre dans le logiciel de traitement les images sélectionnée	s 1	~	Ŷ	
38	CHANGER - Format	ST	ANDARD - tous types d'image vers un type précisé ('JPG', 'PNG', 'TIF',	'B 2			Refresh orde
39	INVERSER - Couleur	ST	ANDARD - tous types d'image vers un type précisé ('JPG', 'PNG', 'TIF',	'B 3		1	
49	COMPTER - Cellule	ST	ANDARD - compte le nombre de cellules	4			
55	EDITER - Film	ST	ANDARD - Présente les images en stack (film)	5			
						52	Add
						1	Delete

Add or remove macros using the 🗭 = buttons. You can also modify their position (order) using the 🗊 🕃 buttons to move up or down and update the order (according to the filter applied) using the Refresh order button.

The Guide button enables you to view the user guide for the selected macro.

9.2 – Analysis



This window enables you to manage images, files and perform analyses of the study.

You will find the main tables here: "**Study**" and "**Acquisitions**" (at the top), and then in the details tables (in four tabs), tabs for "**macros**", "**images**", the "**files**" and the management of "**analyses**"(this tab only appears during analysis).

<u>File S</u> tudy <u>M</u> acro <u>F</u>	ast Processing Processing Software	<u>Referential Options Mo</u>	dule Window <u>H</u> elp	_ 8
			List of images	[11]
Gearch Criteria (You can use the %)—			,	
Type Name	Species		C) Previo	us Next 😔
st of studies [23]	Jpecies		U	2
C_ETUI%, AD1_A_	NOM • A205	A LIBELLE ^Q ↓ [‡] ETS LIB	State	NAME 107_NUM
17 Comparaison Couleur Appa		NAKTUINBOU		1
12 Couleur des Feuilles	Exemple	Groupe d'Etude	et de MOUTAULT Benjamin	1
2 Couleur des Fleurs (Orchio	dées) Exemple	Groupe d'Etude	et de MOUTAULT Benjamin	1
	m			F.
st of acquisitions [11]				
ACQUIS	A02_D_DATE_ACQUISITIC	DN©√‡ A04_A_NOM ©√‡ A	05_A_NOM 🔍 🗘 A05_A_LOCALIS/	
2 Var_Extract	25/09/2012	Document PDF UPOV		🚖 🔂 Load all images
3 Var_1	25/09/2012	Document PDF UPOV		images
4 Var_2	25/09/2012	Document PDF UPOV		👻 📑 Load a
			•	directory
		.	Analyza	
Macros	jes Files		Analyze	
-Search Criteria			chide_Variety_3.bmp (selected numb	er 1)
Туре	🔜 🔀 🔯			
ist of images [11]			State.	
	NORIQ [‡] A201 A LII			
A13_A_NOM_FIC_IMAGE		BELLE 1	A State	
Drchide_extract.bmp	1 Non Défini			
Drchide_extract.bmp Drchide_Variety_1.bmp	1 Non Défini 1 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp	1 Non Défini 1 Non Défini 2 Non Défini			
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp Drchide_Variety_4.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini 4 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp Drchide_Variety_4.bmp Drchide_Variety_5.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini 4 Non Défini 5 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp Drchide_Variety_4.bmp Drchide_Variety_5.bmp Drchide_Variety_6.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini 4 Non Défini 5 Non Défini 6 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp Drchide_Variety_4.bmp Drchide_Variety_5.bmp Drchide_Variety_6.bmp Drchide_Variety_7.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini 4 Non Défini 5 Non Défini 6 Non Défini 7 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp Drchide_Variety_4.bmp Drchide_Variety_5.bmp Drchide_Variety_6.bmp Drchide_Variety_7.bmp Drchide_Variety_8.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini 4 Non Défini 5 Non Défini 6 Non Défini 7 Non Défini 8 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp Drchide_Variety_5.bmp Drchide_Variety_6.bmp Drchide_Variety_7.bmp Drchide_Variety_8.bmp Drchide_Variety_8.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini 4 Non Défini 5 Non Défini 6 Non Défini 7 Non Défini 8 Non Défini 9 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp Drchide_Variety_4.bmp Drchide_Variety_5.bmp Drchide_Variety_6.bmp Drchide_Variety_7.bmp Drchide_Variety_8.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini 4 Non Défini 5 Non Défini 6 Non Défini 7 Non Défini 8 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp Drchide_Variety_5.bmp Drchide_Variety_6.bmp Drchide_Variety_7.bmp Drchide_Variety_8.bmp Drchide_Variety_8.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini 4 Non Défini 5 Non Défini 6 Non Défini 7 Non Défini 8 Non Défini 9 Non Défini	Save as		
Drchide_extract.bmp Drchide_Variety_1.bmp Drchide_Variety_2.bmp Drchide_Variety_2.bmp Drchide_Variety_3.bmp Drchide_Variety_5.bmp Drchide_Variety_6.bmp Drchide_Variety_7.bmp Drchide_Variety_8.bmp Drchide_Variety_8.bmp	1 Non Défini 1 Non Défini 2 Non Défini 3 Non Défini 4 Non Défini 5 Non Défini 6 Non Défini 7 Non Défini 8 Non Défini 9 Non Défini	Save as		

9.2.1 – How to use this feature

Select the study to display the list of acquisitions and macros. Select one or more acquisitions to display images and files. Finally, select the macros, images (and files) to launch the analysis.

9.2.2 - Macros

You need to tick the macros you want to run during the next image-processing operation.

Macros	Images	Files	😥 Analyze
List of valid macros [4] b_VA[©] A03_A_ PIVOTER - Cotyléc BINARISER - Man	NOM Jons YAN - uel YAN - Jons + BINARI YAN -	Files A03_A_DESCRIPTIO Colza, cotylédons - pivote cotyléc Colza, cotylédons - méthode simp Colza, cotylédons - méthode simp mesures OCVV largeur, longueur	Macro - PIVOTER - Cotylédons [ORIGINAL] Macro - PIVOTER - Cotylédons [ORIGINAL]
			// voir ou non les images
			[P_*.*.MC]

The list of macros is displayed when a study is selected.

Whenever you select a study, the macros list is updated (macros are in their **initial** form).

When you select a macro, its rich text content (RTF) is displayed on the right side. <u>You can modify it (temporarily)</u> to suit the needs of upcoming processing operations. For example, if the macro has a header section, it is easy to adapt some of the values without permanently changing the macro in the database (of the application's macros).

Any changes are stored temporarily, even if you modify the macro. Until you refresh the display list : by selecting a study, or by switching windows, for example.

The purpose of the "macros" tab is to inform AIM of the processing operations you have selected and their running order.

	List of valid macros [4]	
Inactive	B_VA [‡] A03_A_NOM Q [‡]	A03_A_DESCRIPTION
	PIVOTER - Cotylédons YAN - Colza, d	cotylédons - pivote cotylédons 🔺
Active _	BINARISER - Manuel YAN - Colza, d	cotylédons - méthode simple, se
	PIVOTER - Cotylédons + BINARI YAN - Colza, o	cotylédons - méthode simple, se
_	MESURER - Mm - n°image YAN - mesure	s OCVV largeur, longueur sur c
First	Second	

9.2.3 – Images

You must select the images to be processed during the next processing operation.

Macros Images	Files		9	Analyze	
Search Criteria			Refreshes	NB_P_vanC0001_1.png (selected numb	er 1)
Туре 💌	🗌 🗙 🔕	🕗 Ctrl A		Via con addresses	
List of images [3]			샵 Up		
A13_A_NOM_FIC_IMAGE	N_ORIQ [‡] A201	A_LIBELLE 🛅	5 Down		
yanC0001_1.jpg	1 Initiale - Couleur	*	Cause an	♥ ♥ ♥ ♥	• 🌳 👘
P_yanC0001_1.jpg	21 Modifiée - Couleu	ır	Save as		
NB_P_yanC0001_1.png	41 Noir et Blanc		👁 Open		
				· · • • • •	
			🕂 Add		•
			💪 Modify Type		
			💻 Delete	· · · · · ·	-
			💪 Day Retention		

The list of images is displayed (updated) when you select one or more acquisitions. The images are saved by acquisition, meaning that the link to the declarative section in the previous window can be maintained.

Caution: when uploading images take care to select the correct acquisitions.

9.2.3.a – How to use this feature

The "images" tab contains the list of images, a search bar and various action buttons and displays the images in the right hand section.

*	🕂 Add	Add images, using Windows selection feature.
*	💻 Delete	Delete selected rows.
*	🔏 Modify Type	Modify image type.
*	ပ္ခ် Up	Down Change the order of the images in the list.
*	🎲 Refresh Order	Update the order in line with the current filter in place (name)
*	👁 Open	Open the image with your default software (e.g.: Picasa).
*	📕 Save as	Save the selected images to disk.
*	×	Delete search criteria.
*	3	Display (redisplay) the image list.
*	Ctrl A	Select (unselect) all images.

You can filter the list of images displayed by using "Search criteria" "select type of image".

This filter is very effective when using different types of images:

- color - black & white – superimposed- ...

Search Criteria Type	× 3
List of in EC	Echelle
List of in	Initiale - Couleur
yanC00	Initiale - Inversée
	Initiale - Couleur - Refaire
P_yan(MC	Modifiée - Couleur
NB_P_NB	Noir et Blanc
NC	Niveau de Gris
NDEF	Non Défini
SC	Superposée - Couleur

Load all

9.2.3.b – Loading images

You have four options for loading images into acquisitions (directories).

- Select the acquisition, then in the "Images" tab click on the "Add" button, search for the images on your computer and confirm your selection.
- Select the acquisition, place cursor on the "Images" tab, from your desktop (*Windows*) select the images and drag and drop them onto the AIM list.
- Select one or more acquisitions and click on the mages button. This method works if you have defined the loading directories in the "Declaration" window (§ 9.1.5.). AIM will load all the images it finds, by acquisition, even if the image had been previously uploaded.



Click on directory and indicate the directory containing all your images. A list will appear with the titles of the images, the order of which can be changed if

necessary 12. You can select another directory and remove specific images

Comment : The fourth option is available when loading <u>all your acquisitions</u>. The order of your acquisitions in this list is important (sorted by date, name, etc...., or defined in the previous window (§ 9.1.5.)).

List of acqu		A02_D_DATE_AC		Images of directory -C:\Users\MOUTAU~1\Desktop\Temp1 Name	a 🗔 🖬 🗖
351	Var_1 - r1	16/05/2 🔺		LOGOGEVESE&P+accro+snes.jpg	Correspondence
352	Var_1 - r2	16/05/2 ≡		MinistereGIPtutelle.jpg	1 for 1
353	Var_1 - r3	16/05/2	Hide Cancel	INRA.bmp	E It Load
354	Var_1 - r4	16/05/2	Cancer	Nouvelle image bitmap (2).bmp	
355	Var_2 - r1	16/05/2		Nouvelle image bitmap (3) - Copie.bmp	
356	Var_2 - r2	16/05/2		Nouvelle image bitmap (3).bmp	
4	/) -) 	10/05/3		Nouvelle image bitmap - Copie.bmp	-

Images will be loaded by matching the left and right-hand lists (acquisitions and

images).

	des acquisi			n 🕝 🔰 🛛 Images du répertoire - \\moutaultb-p\c\$\Ben_Docs\AIM\AIMGUI~1\F 🗔 👩 📻 🥃		
f•°,	<u>ACQUIS</u>	🖣 А02_А_NOM 🍳	A02_D_DATE_ACQUISI	I Images du répertoire - \\moutaultb-p\c\$\Ben_Docs\AIM\AIMGUI^\+ + Nom Q_		
9	50 993	Var_2501	25/05/2012 📥	Var_2501_r1.bmp Correspondance		
9	50 994	Var_2502	25/05/2012 🚤	Var 2501 r2 bmp 1 pour 1		
9	50 995	Var_2503	25/05/2012 🛌	Was 2502 of here		
9	50 996	Var_berlikumer	25/05/2012	Annue Val_2302_r1.0mp Val_2502_r2.bmp		
9	50 997	Var_blanche a col	25/05/2012	Var_2503_r1.bmp		
9	50 998	Var_bolero	25/05/2012	Var_2503_r2.bmp		
9	50 999	Var_de colmar b	25/05/2012			
				🖡 Hide		

In the example below, each acquisition will contain two images.

If you want to delete/hide this part of the "Load a directory" window, click on

Comment : by default, the images added to acquisitions are "undefined" types. We recommended that you specify the image type for better image management.

9.2.4 – Files

You must select the files to be processed during the next processing operation.

Macros Images	Files		😥 Analyze
List of Files [1]		Refresh Order	[ETUDE] NOM-Métrologie des bancs - COLZA
A25_A_NOM_FIC TABLE A25_A_NOM_FIC AIM Parametres.Ini 1		û Up	ESPECE=Colza d'hiver
		Down	[ACQUISITION] NOM=11_08_03_Colza_1_2
		Save As	DATE=25/10/2012 SUPPORT=Cam_4; Banc_1
		s Open	REPERIORE=
		Add Delete	[CONDITION] FREQ=2; en heure GROS=52; pixel par 10 millimetres
			HREF=4; NCPC=10;
		🖕 Day Retention	NCPL=10; SDEP=0.3;
		🖰 Generate	IMATERIEL1

This tab allows you to manage files and images (see §9.2.2) and is equipped with an additional function:

 Generate enables you to create a file automatically: AIM_Parametres.Ini, which retraces information about the study and the acquisition.

Cancel

9.2.5 – Analyses

You must click on	Ø	Analyze	to start the next processing operation.
		(havir	ng previously selected the macros, images and files)

Macros	Images	Files	Analysis (in progress)		😥 Analyze	A	najiyaja ju brođijeza
	Directory	4	Restart	🗸 Close	× Canc	el	
€&_TRAITE&	START DATE		ME Q,≑	ACQUI_NAME Q	MACRO_NAME	୍ୟ [‡] PHASE ୍ୟ	1
4 425	12/02/2014 10:37:53	Couleur des Fleurs (Orchi	idées) Var_Extra	act	MESURER - Niveau de Couleur - R'	/B v ATT	*

This tab enables you to monitor processing operations, to relaunch or halt a processing operation in case of macro, user, image-processing software or AIM errors.

4	Restart	Relaunch the same processing operation.
v	Close	Force the end of processing operation and retrieve the output files.
×	Cancel	Force the end of processing operation and cancel the retrieval of

the files.

AIM will indicate when a processing operation is ongoing by means of a flashing message.



Caution: the names of the images sent for processing by macro are slightly modified by AIM. AIM concatenates the image code, enabling the software package to know under which acquisition they need to be registered upon their return.

9.3 – Integration



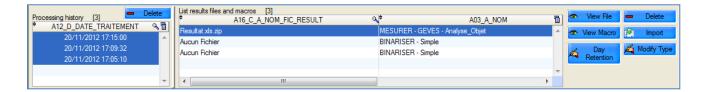
This window enables you to consult and delete processing operations relating to the acquisitions (with or without the results files).

It is possible to integrate these measurements into the database by choosing the result variables that are to be saved.

🞃 AIM - Managing image processing and an	alysis - [Integration]					
	sing <u>P</u> rocessing Software	<u>R</u> eferential <u>Options</u>	M <u>o</u> dule Wi <u>n</u> dow	<u>H</u> elp		_ <i>8</i> ×
	🔊 🔁 🚄 💻 🖄	📧 🖸 🖸 🖬	<u>r</u>	D)isplay	
Search Criteria (You can use the %)					C) Prev	rious Next 😜
Type Name	Species A205 A L					
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43 Pouvoir couvrant des plantes (en ch			d'Etude et de RETAILLEAU	Jean-Michel	1 40 843	Pois protéac Cette étude
40 Dénombrer des plantes (ieunes)	Phase de test III	Groupe	d'Etude et di RETAILLEAU	Jean-Michel	1 0	Espece incr
ACQUIS A A02_A_NOM	م¢ A02_C	DATE_ACQUISITION	A04_A_NOM A	A05_A_NOM	A05_A_LOCALISATIO	N 🌾 🛅
371 Obj_1		16/05/2012	App. Photo	GEVES		<u>^</u>
372 Obj_2		16/05/2012	App. Photo	GEVES		E)
373 Obi 3 ∢		16/05/2012	App. Photo	GEVES		- F
Processing history [1] ■ Delete	List results files and macros [1] A16_C_A_NOP Pouvoir_Couvrant xls.zip	M_FIC_RESULT	ে,≑ TRAITER - Pouvoir	A03_A_NOM Couvrant v2	Nev	ew File Delete v Macro import Day tention
· · · · ·	•	III				
File [6] Options	Number of variables result already	r integrated for this treatment	t = 0, and number of measure	ements = 0		
Pouvoir_Couvrant.xls [6]	S Displa		Integrate	- Remove	Color Export	
Num Label 🔍 Area	Plant Area					1
1 peas field low_1.jpg 3 774 27	76 801 155 21.2					*
2 peas field low_2.jpg 3 774 27						
3 peas field mean_1.jpg 3 774 27						
4 peas field mean_2.jpg 3 774 27 5 peas field strong 1.jpg 307 200						
6 peas field strong 2.jpg 307 200 307 200						
	201100 00.0					
						·
Current DataBase = Ange_Adre (User = moutaultb) -	-Current field = Tab_Resultat				12/02/2014	10:40:54

There are two main tables: **studies** and **acquisitions.** The details table contains the list of processing operations (history), results files and results.

9.3.1 – Processing history and results files



Each time an analysis is launched, AIM records the date of execution. Linked to each date you have either: one or more result files

"no files" if the macro does not generate any

"processing canceled" if the analysis was halted manually.

You can delete this history using the Delete button. Be careful, as each deletion involves the cascade deletion of the attached results files, as well as the measurements in the database, calculations and clustered items.

You can delete results files using the Delete button (this does not involve cascade deletion of basic measurements, calculations and clustered items).

You can view the macro used for the processing operation: A View Macro.

You can view the results file, in the format in which it was saved ^{Mew File}

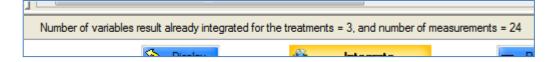
You can import your results file manually **mont** should there be any modifications or corrections.

Day Retention

You can manage types of results files (§ 5.1.3.) A Modify Type

as well as the number of days for which they are saved

When you select one or more processing histories, AIM informs you of the number of result variables and measurements already integrated into the database.



9.3.2 – Display

You must select a processing row that contains one or more result files. Select

file/files, place the cursor on the tab "File" and click on the Display button.

The format of the result file, which comes from the image-processing software (ImageJ) should be a "Text" file (the extension is not important, e.g. txt, xls) with the first row showing the column headings and separated by a tab. See the example below.

Fichier Edition	Format Affichage ?			
2 peas 3 peas 4 peas 5 peas	el s field low_1{4007466}.jpg s field low_2{4007467}.jpg s field mean_1{4007468}.jpg s field mean_2{4007469}.jpg s field strong_1{4007470}.jpg s field strong_2{4007471}.jpg	Area 3774276 3774276 3774276 3774276 3774276 307200 307200	Plant Area 801155 798524 1125916 1123557 201543 201459	Covering Power % 21.2 21.2 29.8 29.8 65.6 65.6

Once integration into AIM is complete, you will see:

Pouvo	ir_Couvrant.xls [6]			S cuopus
¢ Num⁰∖	¢ Label ۹	🕈 Area 🔍	🕈 Plant Area 🔍	Covering Power %
1	peas field low_1.jpg	3 774 276	801 155	21.2
2	peas field low_2.jpg	3 774 276	798 524	21.2
3	peas field mean_1.jpg	3 774 276	1 125 916	29.8
4	peas field mean_2.jpg	3 774 276	1 123 557	29.8
5	peas field strong_1.jpg	307 200	201 543	65.6
6	peas field strong_2.jpg	307 200	201 459	65.6

9.3.3 – Options

One stage prior to integration (into the database) is the **indexing** of measurements. This is done automatically with each display of results files ("File" tab) and takes into account the selected options ("Options" tab).

File [6] Options	Number of variables result already integrated for this treatment = 0, and number of measurer				
Choose the type of indexing	 Simple Tracking Incremented Manual Disabled 	Determined for each image, with coordinates X, Y. Determined to the first image, with coordinates X, Y and follow-up on the next images (by distance calculation) Assigned to each image, by incrementation. Copied from the columns of the result file. The result file is not indexed to the display.			
Indexing : column name "X"	×]			
Indexing : column name 'Y'	Y]			
Restart indexation	S Indexing				

Indexing enables AIM to handle each of the different measurements in the results files on an individual basis, enabling them to be registered in the database.

When images contain more than one object, it is necessary to be able to distinguish between them. AIM attributes the following values: Row/Column/Zone to each measurement.

By default, all images are subjected to "incremental" indexing as a part of which objects are numbered for 1 to N.

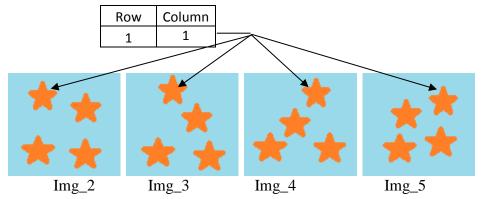
Example with four objects:

	Row	Column
🔭 🛖	1	1
	1	2
	1	3
→ ×	1	4

"**Simple**" indexing is carried out for each image based on the X and Y coordinates of the objects and the elements declared for the acquisition.

			Row	Column
List of conditions [0]		X X	1	1
A200_A_LIBELLE	્યે [‡] _N_VAL_CONDITાલ્પ		1	2
Nombre Cellule Par Colonne	2		2	1
Nombre Cellule Par Ligne	2		 2	2

"**Track**" indexing is carried out on the first image on the basis of the X and Y coordinates and the elements declared (as above). For subsequent images, the calculation of the minimum distance is used.



The aim here is to maintain the same identifiers, namely Row/Column/Zone for the objects, and to track them throughout the whole series of images, even if they have been displaced.

"**Manual**" indexing is performed by copying the Row/Column/Zone values from the results file columns.

A window will pop up to ask what these

columns are. Select a column, click on \bigcirc to define it as a row, column or zone. You can also double-click.

olumn				Zone			
	Caption	۵ 🖬		÷	Caption	٩	1
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The "**De-activated**" indexing option enables you to take no action and simply to display the result file. However, you will not be able to integrate the measurements into the database.

For "**Simple**" and "**Track**" indexing options, AIM uses the names of columns X and Y for the calculations. If the names of the columns are different in your results file, you can indicate this manually.

Indexing : column name 'X'	×
Indexing : column name 'Y'	Υ

You can also relaunch indexing manually, using the 🔯

Reminder: the names of the images sent for processing by macro are modified by AIM. AIM concatenates the image code, making it possible –once measurements are returned-to know under which image and acquisition the measurements should be saved.

Indexing

button.

Caution: When saving measurements, the image code is important because it provides a link with the description of the material made in the study declaration. If AIM cannot make that connection, it will require you to enter a valid image code manually. To do this AIM opens a text file (Lecture.txt) containing the list of valid images and their codes.

Integration *	Reading.txt - Bloc-notes
	Fichier Edition Format Affichage ?
I can not find the image code in the following label : [Orchide_Variety_4{5000009}]	Here is the list of images (7-digit codes) that can be used to finish the display of the results file.
Please enter it manually (example 9003746). You can help you valid codes present on the file 'Reading.txt'. [C:\OraTmp\Aim\FICHIERS] Thank you	Orchide_extract.bmp 4000009 Orchide_v1.bmp 4000010 Orchide_v2.bmp 4000011
0	Orchide_v3.bmp 4000012 Orchide_v4.bmp 4000013 Orchide_v5.bmp 4000014
OK Cancel	orchide_v6.bmp 4000015

9.3.4 - Integrate

In the "File" tab you can integrate the results columns of your choice.

To do this, click on the **Integrate** button and a window will open to allow you to select result variables for integration.

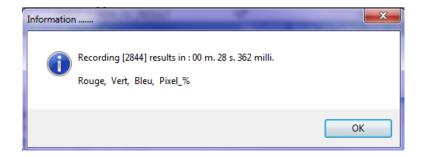
	suit vanables w	vith their type [4] A202_A_LIBELLE	Q.2_N_ORE	152 A UNI	¢	A202_A_LIB_IMAGEJ	1
	Rouge		59	valeur	Rouge		-
60	Vert		60	valeur	Vert		
61	Bleu		61	valeur	Bleu		
62	Pixel_%		62	%	Pixel_%		
							-
۰ 📃			111				- F

The result variables have been defined to match the column headings in ImageJ (often in English).

Select one or more rows and confirm by clicking on



A message window will warn you that the result variables have been saved and will inform you of the number of rows that have been integrated.



9.4 – Calculations



This window enables you to launch pre-defined calculations for variables previously recorded in the form of a spreadsheet within which a formula may be applied.

<u>F</u> ile	<u>S</u> tu	dy <u>M</u> acro <u>F</u> ast	t Processing	Processing Software	e <u>R</u> efere	ential	Options Mo	dule Wi <u>n</u> dow	<u>H</u> elp	_ 5
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2	Coule	eur des Fleurs (Orchidée:		Exemple			Groupe d'Etude	et de MOUTAULT	Benjamin	1
			111							+
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3	Var_1			25/09/2012		Document	PDF U	IPOV		
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		and results of acquisition		14						Hide Result
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This method can be used to carry out pixels ⇔ millimeters conversions, for example.

Comment: Most of the work is done at the level of the declaration of formulas. (see § 5.4.).

9.4.1 – How to use this feature

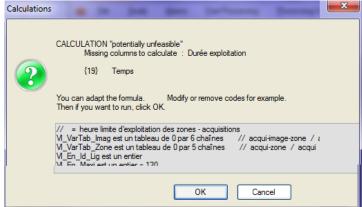
Display the results of a study, acquisition or processing operation using the button.

Then click on the Calculate button to open the window to select the result variables.

C_C(Q	A202_A_LIBELLE	2_N_ORE®	02_A_UNI®	
20	Image	20	numéro	// = Incrémente à chaque nom d'image différent
63	UPOV_grp	63	numéro	// determine la couleur UPOV (groupe) par les valeurs RVB
64	Pixel_%_UPOV	64	%	// Somme des Pixel_% par Grp_Couleur_UPOV et par image
65	RHS_grp	65	numéro	// determine la couleur RHS (groupe) par les valeurs RVB
68	Pixel_%_RHS	66	%	// Somme des Pixel_% par Grp_Couleur_RHS et par image
66	GEVES_grp	67	numéro	// determine la couleur GEVES (groupe) par les valeurs RVB
67	Pixel_%_GEVES	68	%	// Somme des Pixel_% par Grp_Couleur_GEVES et par image
70	VKC_grp	70	numéro	// determine la couleur VKC (groupe) par les valeurs RVB
71	Pixel_%_VKC	71	%	// Somme des Pixel_% par Grp_Couleur_VKC et par image
72	Rang Couleur	72	valeur	// Rang de chaque couleur pour une image
73	Rang Couleur RHS	73	valeur	// Rang de chaque couleur pour une image
Th	e highlighted rows indicate the	e result varial	oles : - Alrea	dy calculated [in RED]. - Probably calculate [in GREEN].
Cor	nplete List			OK Close

Comment: formulas are based on other result variables, information defined in the study declarative section, or columns in the table;

If one formula is missing or contains an error, the calculation stage will generate an error message.



Otherwise, the data will be calculated and recorded, and the new "results" displayed.

Display	Calculate				Color Export V Hide Colu					I	
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174		0.016252		838		13.612726	1	299		0.016252	-
211		0.113761		859		17.401373	7	770		4.637793	
205		1.038069		859			1	770			
224		5.29395		840		8.030308	3	306		5.29395	
218		3.485963		859			7	770			

You can relaunch the operation with new formulas, which can be based on the new "results".

	esult variables with their type ↓ A202_A_LIBELLE	[38] 2_N_ORE		¢	A202 CL FORMULE	0
20	Image	2_11_011_4	numéro	//	= Incrémente à chaque nom d'image différent	~
63	UPOV and	63	numéro	11	determine la couleur UPOV (groupe) par les valeurs RVB	
64	Pixel % UPOV	64	%		Somme des Pixel % par Grp Couleur UPOV et par image	
65	RHS_grp	65	numéro		determine la couleur RHS (groupe) par les valeurs RVB	
68	Pixel_%_RHS	66	%		Somme des Pixel % par Grp Couleur RHS et par image	
66	GEVES grp	67	numéro	//	determine la couleur GEVES (groupe) par les valeurs RVB	
67	Pixel % GEVES	68	%	11	Somme des Pixel_% par Grp_Couleur_GEVES et par image	
70	VKC_grp	70	numéro	11	determine la couleur VKC (groupe) par les valeurs RVB	
71	Pixel_%_VKC	71	%	11	Somme des Pixel_% par Grp_Couleur_VKC et par image	
72	Rang Couleur	72	valeur	11	Rang de chaque couleur pour une image	
73	Rang Couleur RHS	73	valeur	//	Rang de chaque couleur pour une image	

Color indicators are provided to help you.

Highlighted in red: the result variables that have already been calculated Highlighted in green: the result variables that probably need to be calculated.

By default the list of result variables is limited to those which are of interest to you. However,

you can display the whole list using the tick box Complete List .
Results can be exported to Excel using the Export button.
You can color the rows of the table using the Color button.
Automatically hide part of the calculation table columns I Hide Column

9.5 – Results



This window displays the results of a study (raw, calculated and clustered results). It also makes it possible to cluster and delete data from the database.

<u> </u>	e <u>S</u> tudy	Macro East Processing	Processing Softw	are <u>R</u> eferent	tial <u>O</u> ption	is M <u>o</u> dule W	∕i <u>n</u> dow <u>H</u> elp		- 8
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63	UPOV grp		63 numéro					oupe) par les valeurs R	
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9.5.1 – Display

Select your study; the full details are displayed in the second part of the window. There are six tabs describing the materials, acquisitions, images, processing operations, result variables and statistical parameters which are part of the study.

Everything is pre-selected by default when you open the window, or switch to another study. You have the choice of de-selecting or selecting one row or another from one tab or another in order to refine what is displayed or deleted.

Caution: When you use the Next and Previous buttons to switch windows, AIM pre-selects

the same study and the same acquisitions 😔 Previous

Other available filters include:

	Type of results	Cell - Image	[Aim 14]	💌 🚫 Display 🔽 In column
- Results type	Type of results	Cell - Image	[Aim 14]	(see § 9.5.2)
		Cell - Image Cell - Acquisition	[Aim 14] [Aim 19]	
		Zone - Image Zone - Acquisition	[Aim21] [Aim20]	
		Object	[Aim20] [Aim22]	

- The tick box "**In column**" governs the layout of the result variables.

Select the elements you wish to display, then click on the Display button.

9.5.2 – Type of result

Cell – Image [Aim14]: raw and calculated results defining the cells, zones, images and acquisitions in your study.

The following types are all results obtained from clustering operations (A19, A21, A20 and A22).

Cell– Acquisition [Aim19]: defining cells, zones and acquisitions. In this case, the image feature has been removed (image series).

Zone – Image [Aim21]: defining zones, images and acquisitions. In this case, the cell feature has been removed.

Zone – Acquisition [Aim20]: defining zones and acquisitions. In this case the cell and image features have been removed.

Object [Aim22]: defining objects. In this case everything has been removed and only objects are clustered.

9.5.3 –Clustering			
Select your study and click on the	2	Regroup	button.

🎃 Parame	ters Statistics		-	_		-		x
Material [1	1] Acquisition [11]	Image [11]	Process [1]	Var_Result [8]	Param_Stat [7]			
06_C_C0[0		A_LIBELLE	\$		A206_A_T	EXTE_SQL		۹ 🖬
COUN	Compte		CC	DUNT				~
ECAT	Ecart-type		ST	DDEV				
MAXI	Maximum		M	AX				
MEDI	Médiane		M	EDIAN				
MINI	Minimum		M	N				
MOYA	Moyenne Arithmétiq	ue	A۱	/G				
NDEF	Non défini		A۱	/G				
								-
0.1.1.1/17								
	erent types of groupin LL II - Acquisition [Aim19]	-	GE e-Image [/	Aim21] ॉ Zi	CQUISITION one - Acquisition	[Aim20] 😡	MATERIAL Object [Aim2	2]
				ОК		Close		

A window will open and you will be able to select the material(s), acquisitions, images and processing operations covered by the clustering function, as well as the type/types of statistical parameters and clusters desired. Then confirm using the OK button.

Example_1: For an overview of this clustering step, we will look at the example of a study involving four varieties. I have measured a "Volume" for a series of images using image-processing software ("Analysis" window).

AIM14	RES	ULT_CEL	LULE_IMG [7267]							
SBJE 🔍	2	JET_NU	OBJET_NOM	t <	ONE	_NOP IMAGE_NOM	⊂¶GNE	ALONIA	🕈 Volume 🔍	Temps 🍳
NDEF	9	1	Variété_1	1	HG	NB_Mais_0902161545_1	1000.; 1	1	11.855113264	0
NDEF	9	1	Variété_1	1	HG	NB_Mais_0902161545_1	1000.; 1	2	11.690723059	0
NDEF	9	1	Variété_1	1	HG	NB_Mais_0902161545_1	1000.; 1	3	12.3190327472	0
NDEF	9	1	Variété_1	1	HG	NB_Mais_0902161545_1	1000.; 1	4	11.8348133728	0
NDEF	9	1	Variété_1	1	HG	NB_Mais_0902161545_1	1000.; 2	1	11.5429905162	0

I integrated these results into the database, giving a total of over 7,000 measurements, as I have several cells (seeds) per image and have around 50 or so images.

I have calculated a "Time" based on the frequency of images in my series. I wish to cluster my results by variety and by time.

I wish to cluster my results by variety and by time. I select my study (in the "**Result**" window) and click on the

Regroup button.

This action opens the statistical parameters window. I only select the "Volume" and "Time" result variables in the "**Var_Result'** tab.

Matéri	el [4] Acquisition [1] Image [50] Traitement [1] Var	Result [17] Param_St	at [7]				
	OP A202_A_LIBELLE	ALZ_N_ORDO		A CAP	A202_A_LIB_IMAGEJ	4.	ĩ
16	Image	16	numéro	Num_In	hage		
7	Volume	17	mm3			//	= 4/3*[
8	Distance	18	mm	V		11	Ecat du
9	Temps	19	heure			//	= Fréque
1	Germée (H)	21	heure	V		11	Compare
3	Longueur Courbe Radicule	23	pixel	V		11	= Longu
				FT		11	- Tomor

Material [11	1] Acquisition [11] Image [11]	Process [1] Var_Result [8]	Param_Stat [7]
06_C_C0[0	A206_A_LIBELLE	a\‡	A206_A_TEXTE_S0
COUN	Compte	COUNT	
ECAT	Ecart-type	STDDEV	
MAXI	Maximum	MAX	
MEDI	Médiane	MEDIAN	
MINI	Minimum	MIN	
MOYA	Moyenne Arithmétique	AVG	
NDEF	Non défini	AVG	

Then, in the "Param_Stat" tab I choose to calculate an "average".

I then select the type of clustering required: by **zones and images**.

That means I want to remove the cell feature (in order to have on	ly a single volum	ie
measurement per variety and time). I confirm by clicking on the	ОК	button.

I call up a display by selecting "Image-Zone"

Type of results Zone	- Image [Aim21]	💌 🚫 Display	In column
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I then locate the clustered averages for volume and time, with a measurement per variety and per image.

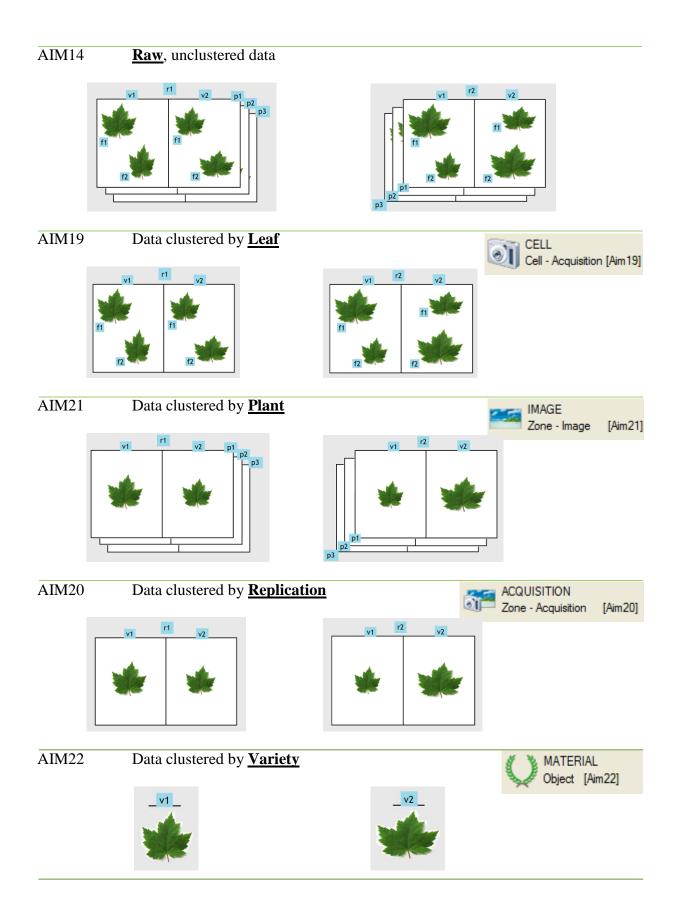
÷ _ E_OBJET_ª	÷_0	⊊ – BJET_NU�	OBJET_NOM @	REPETITION A	¢ DNE_NO�	♥ IMAGE_NOM	♦ Volume Moyenne Arithmétique	Temps Moyenne Arithmétique
Non défini	9	1	Variété_1	1	HG	NB_Mais_0902161545_1000.png	11.7588	0
Non défini	9	2	Variété_2	1	HD	NB_Mais_0902161545_1000.png	11.443	0
Non défini	9	3	Variété_3	1	BG	NB_Mais_0902161545_1000.png	12.1913	0
Non défini	9	4	Variété_4	1	BD	NB_Mais_0902161545_1000.png	11.9116	0
Non défini	9	1	Variété_1	1	HG	NB_Mais_0902161743_1001.png	11.9045	2
Non défini	9	2	Variété_2		HD	NB_Mais_0902161743_1001.png	11.6382	2
Non défini	9	3	Variété_3		BG	NB_Mais_0902161743_1001.png	12.3901	2
Non défini	9	4	Variété_4		BD	NB_Mais_0902161743_1001.png	12.0828	2
Non défini	9	1	Variété_1	1	HG	NB_Mais_0902161943_1002.png	11.984	4
Non défini	9	2	Variété_2	1	HD	NB_Mais_0902161943_1002.png	11.719	4
Non défini	a	2	Voriálá 2	1	PC .	NR Mais 0002161942 1002 ppg	12 5007	А

Example_2: We wish to measure the surface of leaves.

We have two varieties (v1 and v2) and our study contains two replications (r1, r2). We have three plants per variety/replication (p1, p2, p3), and we use two leaves per plant (f1, f2).

In our images we arrange the leaves in two zones, so that each image contains two varieties.

Transposing these elements into AIM; the varieties are the zones, the replications are the acquisitions, the plants are the images and the leaves are the cells.



9.5.4 – Deletion

The deletion step is similar to the display step, as you need to select the study, the

detail (image, material, etc.) and the results type before clicking on **Delete** and confirming your selection.

- *Caution*: the process does not involve cascade deletion. If you delete the [Aim14] results, this action will not delete clustered data in [Aim22]. You have to perform the operation for each result type.
- *Comment*: However, relaunching the clustering function automatically enables you to delete previous clusters in the destination table.

9.5.5 – Graph

This is a feature that enables you to view AIM application data. To do that, you need to display and select (all or part of) the results (see § 9.5.1) (particular attention should be paid to the selection order) and then click on the Graphic button.

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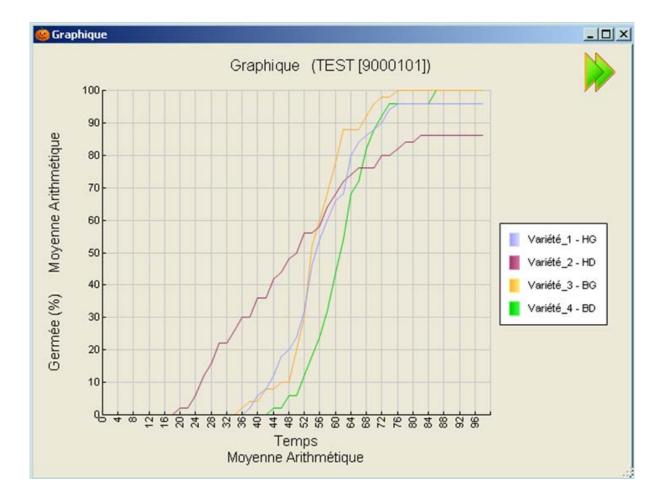
A selection window opens, with a list of usable column labels on the left side of the window ("Column" table).

You must select the series (one or more columns) ("Series" table), the x- value (column) ("X-axis" table) and the y-axis value (one column) ("Y-axis" table).

Use the \bigcirc and \bigcirc buttons to move the "column" labels.

;				Serie			
	Caption	21		·	Caption	্ শ	
TYPE_OBJET_I	NOM	*		OBJET_NOM		-	•
DBJET_SERV			0	ZONE_NOM			
DBJET_NUM			0				
REPETITION							
MAGE_NOM							-
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				Y-axis			
				¢	Caption	্বা	i I
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			0				
			0				
		-					

Confirm your choice using the



By default, the application:

- recalculates the axes boundaries as accurately as possible;
- concatenates the labels of the various series (columnA columnB columnC);
- indicates the name of the study in the title;
- places the key to the right of the graph;
- retrieves the labels of the x- and y-axes as they are.

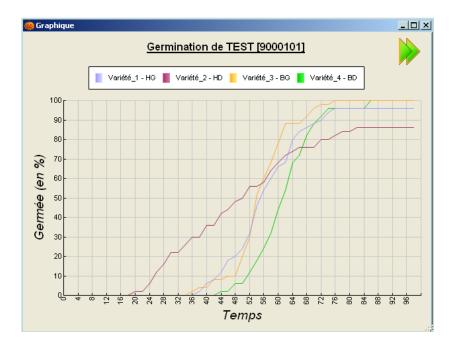
You can change certain features of this graph using the following options:



On the right-hand side of the window, the *miniparticle button* is used to open and close the options panel. Right click on the graph to open the contextual menu.

Title	Graphique (TEST (900010		۲	Chart <u>T</u> ype	۲
X-axis	Temps		Т	<u>F</u> onts	×
A data	Moyenne Arithmétique			<u>L</u> egend	×
			₩	<u>G</u> ridlines	×
Y-axis	Germée (%) Moyenne Arithmétique		بلا	<u>A</u> xes	×
				<u>S</u> tyle	•
Min Y-axis	0	-		<u>Z</u> oom	•
Max Y-axis	100			C	
				Save <u>A</u> s	
	S Display	-	5	<u>P</u> rint	

This enables you to change the axis labels and boundaries, move the key, save the graph or print it.



10 - "Windows" Menu



10.1 – How to use this feature

This feature enables you to manage Aim windows with a single click.

1. Tile

Shows all open windows arranged symmetrically.

2. Cascade

Cascades all open windows.

3. Iconize All

Reduces all windows to icons.

4. Restore All

Enlarges all windows.

- 5. *Align icons* Aligns the icons of reduced windows.
- 6. Close all

Closes all your windows.

After the separate line, AIM listed open windows. To switch from one to another with a simple click.

~	Results	< active
	Main	<inactive< th=""></inactive<>

11 – "Help" Menu



<u>H</u>	elp
) ®	User Manual
3	Help on automatic functionality
3	Mod <u>u</u> les
*	Did you know ?
	Data Dictionary
¥	Data model
2	Query
۲	Dysfunction, Suggestion,
۵	<u>A</u> bout

11.1 – How to use this feature

The "*Help*" menu enables you to find information on the AIM application.

You have access to the "User manual", "Help with automatic functions", "Did you know?", "Data Dictionary", "Data model", "Request", "Software issues, Suggestions,..." and "About ..." to obtain a response to your questions and problems.

"User manual	(??	The AIM user guide, in .Pdf format.
"Help with au	tomatic function	<i>s</i> "
"Did you knov	v?"	
"Data dictiond	ury"	description of AIM tables, in .Htm. format or for Other applications.
"Data model"		the graphic representation of AIM tables, in .Pdf format, or for Other applications.
"Query"		SQL text based on the tables in the application.
"Dysfunction,	Suggestion,"	automatically opens the SOS application and a new record.
"About"	range of informa address for IT su	tion on AIM, including the version number and the email apport.

🎃 About	and some a summer of	
	Application Name :	AIM.exe
	Version :	1.Dh
	Copyright:	Copyright © Gip-GEVES 2014
	Company:	PC SOFT
	Description:	AIM - Managing image processing and analysis
	RAM:	1 Mo
	Support :	Benjamin.Moutault@Geves.Fr
		Christophe.Chevalier@Geves.Fr
Waming: This software is protected by copyright laws and international conventions. To use this product, you accepted the license agreement.	Goto debug mode	ОК

12 – Frequently-asked questions



Question

My list of macros is empty (incomplete) in the Analysis window, even though the macros have been declared properly at the study level (study declaration window).

Answer



?

Only 'active' macros are visible in the Analysis window. Return to the Macro-Management window and validate the macros that you want to see and use in your

		Validity	V
study.	(§ 6.1.2.)	fouillo	

====== END OF DOCUMENT =======