

# ARM

by Gylling Data Management, Inc.

*The Software Solution for Your Research Data Needs*

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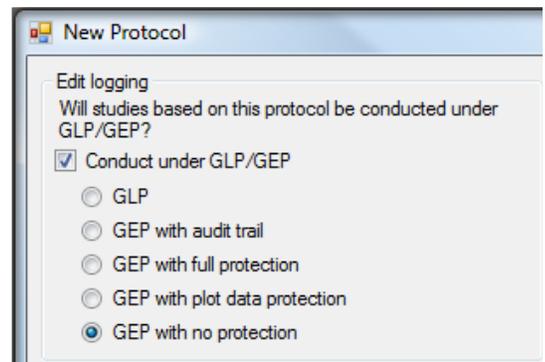
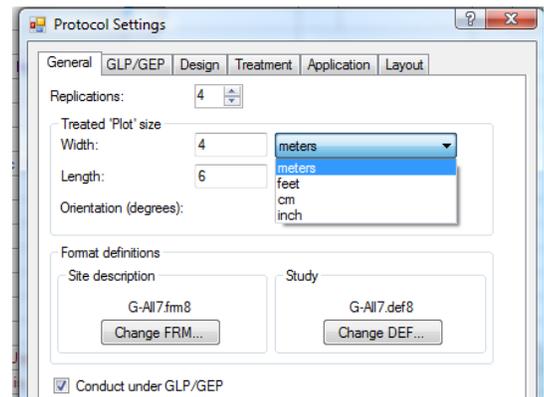
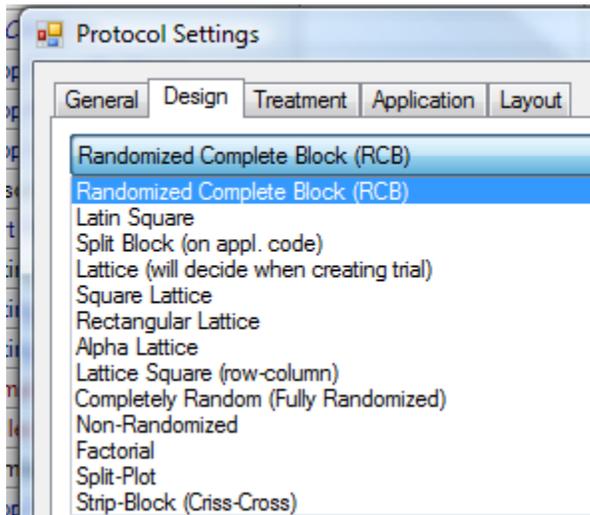
## Why Use ARM Software?

- The ARM is software for **establishing, managing, and summarizing** of herbicide, insecticide, fungicide, seed/variety, fertilizer, general non-chemical, nematicide, and plant growth regulator research on single field or greenhouse trials.
- Managing plant science research data saves time throughout the research season while creating trials, collecting and analyzing data. ARM produces the reports required for successful and timely trial management. Summary reports include integrated statistical analysis that automatically selects appropriate analysis of variance according to selected statistical design.
- It is a respected standard throughout the crop production and crop protection industry in more than 70 countries, many companies and hundreds of universities.

ARM designer has worked with crop protection research for more than thirty years, and understands research needs. We encourage client questions and ideas as GDM does not charge for our support. Many ARM features are suggestions from our current clients.

## ARM Overview

- Trial Size: Up to 999 treatments, assessment data columns, and subsamples per trial.
- Randomize and appropriately analyze trials as randomized complete block, completely random, split block by application, Latin square, non-randomized, factorial, split-plot, and strip-block (criss cross), Lattice (will decide when creating trial); Square Lattice, Rectangular Lattice, Alpha Lattice, Lattice Square (row-column).



- Multi-language: US English, International English, French, German, Italian, Spanish, Portuguese, Polish, Korean, Japanese.
- Optionally conduct under GLP/GEP compliance.
- Transform data using built-in arcsine square root, log, Abbott's % of Untreated, Henderson-Tilton or square root transformations. Average, Count, and Sum Subsamples functions ignore missing data.
- Wide variety of reports with many report options to print to paper, screen, Excel, Word Processor, Adobe PDF or File.

### Data Transformations

Transformations

Square root  $\text{SQR}(X+.5)$ 
 Arcsine square root percent  
 Log  $\text{LOG}(X+1)$

Average subsamples
  % Incidence (0 = none)  
 Sum subsamples
  % Incidence (1 = none)

Abbott (% of Untreated)
  Schneider-Orelli  
 Henderson-Tilton  
 AUDPC (or AUAPC)  
 Standardized AUDPC (SAUDPC=average AUDPC per day)

User formula  
 Formula: \_\_\_\_\_

Options

Limit calculated values to positive  
 Calculate one value per 'Plot' experimental unit if sub

Convert data column number:

Store in data column number:

Number of decimals accuracy:

Print to

Format:

Columns as tables  
 Use tab separated columns when required to keep section borders  
 Tab separated columns  
 Locked objects

Adjust table cell left/right margin by:

Adjust table column width by:

### Assessment Map - Column 5

401	402	403	404	405
301	302	303	304	305
201	202	203	204	205
101	102	103	104	105

Color description

Options	Treatment Description
	0.66 to 1.73
	1.73 to 2.79
	2.79 to 3.86
	3.86 to 4.93
	7.06 to 8.13
	9.2 to 10.26
	10.26 to 11.33

### Print Reports

Available Reports

- [-] Protocol
- [-] Trial
  - ..... Assessment Footnotes
  - ..... Data Collection
  - ..... Data Verification
  - [-] Labels
  - ..... Map
  - [-] Multi-Trial Labels
  - [-] Other
  - ..... Product Amount Totals
  - ..... Schedule
  - ..... Signs
  - ..... Site Description
  - ..... Spray/Seeding Plan
  - ..... Status Report
  - [-] Summary
    - ..... Assessment Data Summary
    - ..... AOV Means Table
    - ..... Factorial AOV Table
    - ..... Correlations
    - ..... Dose-Response Analysis
    - ..... Standardized Summary
  - ..... Tour Report
  - ..... Treatment LST Comments
  - ..... Trial Audit Trail
  - ..... Trial Comments
  - ..... Trial Map
  - ..... Trial Treatments

### Site Description Report Options

Global - General | Global - Page Heading | Global - Borders

Site Description | Site Description Page Setup

Empty fields

Print blanks  
 Print nothing

Field prompts

Bold print  
 Skip for empty fields

Compression

Compress report  
 Compresses out blank lines only when set to "Print Nothing" and "Skip for Empty Fields."

Print selected sections  
 List validation comments

Keep with previous page  
 Print study rules  
 Use fixed-width font

"Use fixed-width font" is ignored when formats or tables are used.

### Gylling Data Manage

An assessment of the efficacy of TUB and other fungicides for the control of Septoria Diseases in winter wheat  
 Trial ID: G-A117\_Fung Protocol ID: G-A117\_Fung  
 Location: Gembloux Study Director: R.E. Cearch  
 Investigator: Your Name

Pest Code	SEPTTR	ZZYYFY	
Crop Code	TRZAW	TRZAW	TRZAW
Part Rated	LE AF2 P	LEAGRE P	GRAIN C
Rating Date	Jul-2-2008	Jul-15-2008	Aug-7-2008
Rating Type	CONTRO	AREA	YIELD
Rating Unit	%UNCK	%AREA	KG
Days After First/Last Applic.	78 29	91 7	114 30
Trt-Eval Interval	29 DA-B	11 DA-C	30 DA-C

Trt	Treatment	Rate	Appl	8	9	10
No.	Name	Rate	Unit	Code		
1	Untreated Check		ABC	0.00 c	2.50 b	7.55 b
2	TUB	0.5	l/ha	ABC	88.74 ab	22.50 ab
3	TUB	1	l/ha	ABC	95.62 a	33.00 a
4	TILT 250	0.5	l/ha	ABC	85.11 ab	29.00 ab
5	MICO 60	1.5	l/ha	ABC	74.09 b	17.50 ab

LSD (P=.05)	12.750	19.667	0.360
Standard Deviation	8.275	12.765	0.234
CV	12.04	61.07	2.9
Bartlett's X2	6.963	12.131	2.316
P(Bartlett's X2)	0.073	0.016*	0.678

AOV Means Table Report Options

Pre-mix Ingredient Fields to Print Global - General Global - Page Heading Global - Borders

AOV Means Table Report Options General Summary General Summary Page Setup

Mean comparison test  
 Test: Student-Newman-Keuls  
 Significance level: 5%  
 Use FAOV complete error for split-plot trials  
 Only when significant AOV treatment P(F)

Adjusted treatment mean  
 Use adjusted mean as primary mean  
 Calculate adjusted mean only when justified by AOV

Mean descriptions  
 Minimum and maximum  
 Standard deviation  
 Adjusted mean (when available)

Arranged  
 Beside mean  Under mean

Descriptive statistics  
 LSD (or HSD if Tukey's)  
 Coefficient of variation (CV)  
 Standard deviation  
 Grand mean  
 Bartlett's homogeneity of variance  
 Friedman's method for randomized blocks  
 Skewness  
 Kurtosis

Exclude untreated treatment(s) from analysis

Mean sorting  
 None  
 Ascending  
 Descending  
 Print one sorted mean column per page

Calculated %s  
 Reported decimals  
 0 (95%)  
 1 (95.3%)  
 2 (95.37%)  
 Print untreated value from original data column for calculated % relative (Abbott) values

Analysis method  
 Traditional AOV  
 Least square estimation

AOV Table  
 None  
 Brief  
 Full  
 Report both adjusted and unadjusted terms

6/21/2008 (G-A117\_Herb)

### Gylling Data Management

Determination of the efficacy and lowest effective dose rate c monocotyle and volunteer grass weeds in Winter Rape when appli

Trial ID: G-A117\_Herb Protocol ID: G-A117\_Herb  
 Location: GERMANY Study Director: R.E. Cearch  
 Project ID: Investigator: Your Name  
 Sponsor Contact:

Trt	Trt Code	Trt Description
1	1	Untreated Check
2	2	HERB 1 50 g AI/ha A
3	3	HERB 1 80 g AI/ha A
4	4	HERB 1 100 g AI/ha A
5	5	STANDARD 125 g AI/ha A

401	402	403	404	405
5	4	3	1	2
301	302	303	304	305
3	2	1	5	4
201	202	203	204	205
5	4	3	1	2

101 Jun-21-2008 (G-A117\_Fung)

Spray/Seeding Plan Report Options

Product Amount Totals Pre-mix Ingredient Fields to Print Sort

Global - General Global - Page Heading Global - Borders

Spray/Seeding Plan Spray/Seeding Plan Page Setup

Product amounts based on  
 Mix size  
 Area of one 'Plot' experimental unit  
 Area of one treatment

Application code  
 Sort by  
 Print selected

Expanded page header  
 Large 'Plot' experimental unit numbers  
 List calculation equations  
 List product amount totals... Options...  
 Include all application codes in study  
 Include only selected application codes  
 Weigh liquid formulations (requires density)

Treatments  
 List ingredients for pre-mixes... Options...  
 Fields To Print...  
 Sort Options...

Spray/Seeding Plan A

## Gylling Data Management, Inc.

An assessment of the efficacy of TUB and other fungicides for the control of Septoria Diseases in winter wheat  
 Trial ID: G-A117\_Fung Protocol ID: G-A117\_Fung  
 Location: Gembloux Study Director: R.E. Cearch  
 Investigator: Your Name

Reps: 4 Plots: 2.5 by 10 meters  
 Spray vol: 200 l/ha Mix size: 2.15 liters (min 2.1502)

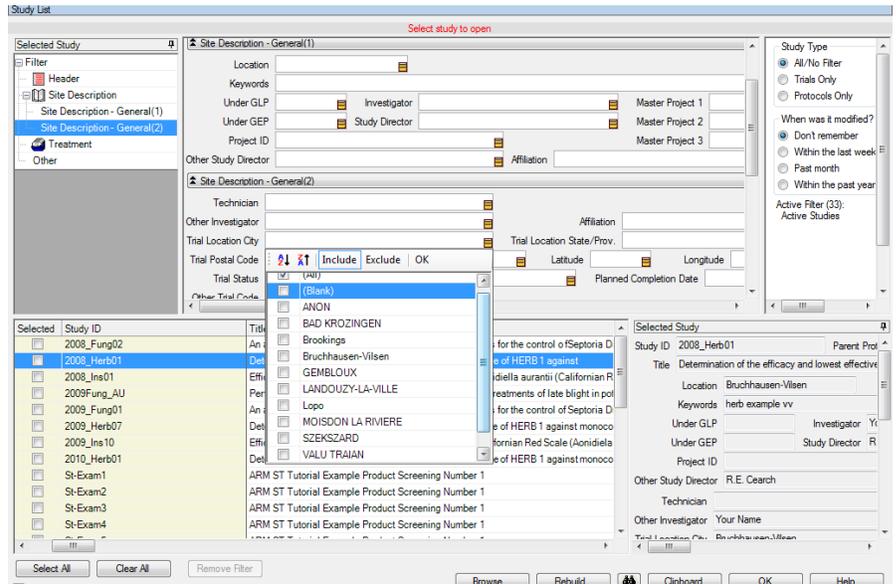
Trt No.	Treatment Name	Form Conc	Form Type	Fom Rate	Rate Unit	Appl Code	Mix Volume	Mix Unit	Mix Size	Amt to Measure	Product	Plot No. Rep. 1	2	3	4
3	TUB	250	G/L	EC	1 l/ha	ABC				10.75 ml/mx		101	202	301	402
1	Untreated Check					ABC						102	205	303	401
4	TILT 250	250	G/L	EC	0.5 l/ha	ABC				5.375 ml/mx		103	204	305	404
2	TUB	250	G/L	EC	0.5 l/ha	ABC				5.375 ml/mx		104	201	302	403
5	MICO 60	600	G/L	EC	1.5 l/ha	ABC	250	L/HA	2.65	Liters	15.9 ml/mx	105	203	304	405

# Current ARM Features

ARM will make you more efficient and effective in managing your research studies. It can help improve research quality, and reduce the time required to report results with clean new visual style that is much friendlier for an infrequent ARM user. Someone familiar with ARM will be immediately productive, since all ARM commands and ways of working are fully supported in updated ARM versions.

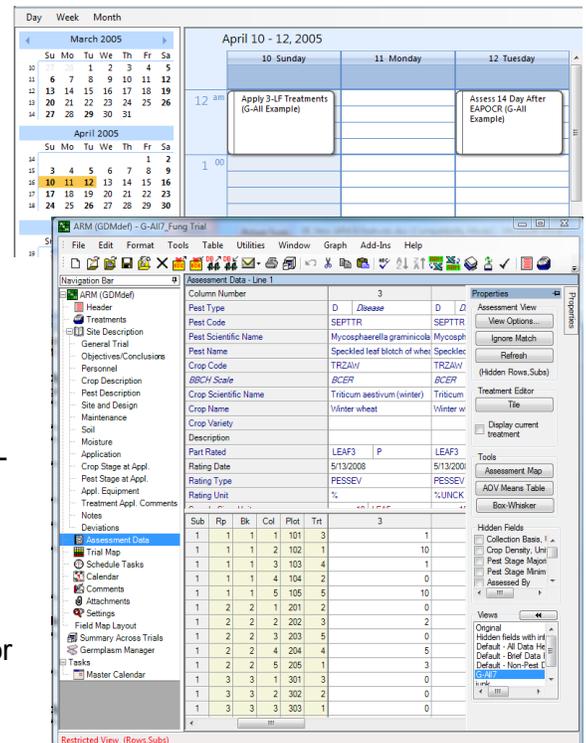
**Study List** is a table displaying key information about all ARM studies on your PC. The new ARM study list design makes it much easier to view, search, select, and manage studies. New features include:

- Split-screen design shows study details on easy-to-read form view.
- More filters to find studies of interest.
- Easily locate trials containing specific treatment products, crops, or targets.
- Use new Filters tab to display list of all unique entries in each study list field, such as location or treatment name.
- File management features to archive, move, rename, or delete study files.
- Easily hide or display archived (completed) studies.
- Restore studies to a previous version, to rollback from an accidental change or file corruption caused by a computer hardware failure. (See Automatic Backups for more information.)
- Launch file tasks from study list, such as printing reports or exporting results.



## Tasks and Scheduling

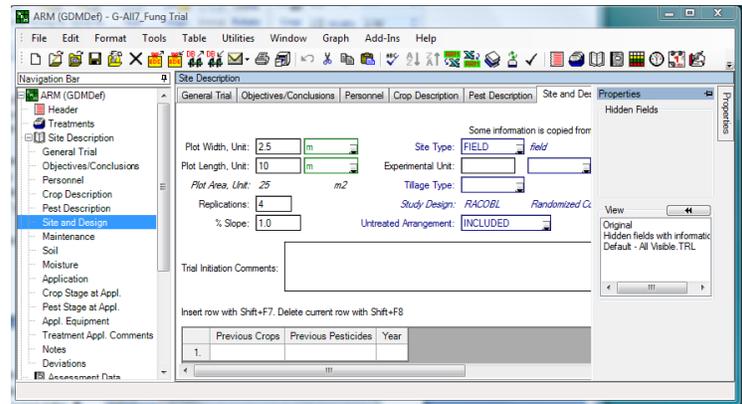
- Study calendar displays scheduled tasks for current study in an Microsoft Outlook style calendar, with choices of day, week, month, and custom views.
- Master calendar shows scheduled tasks for all trials, with the same view options as for study calendar.



## Study Editors

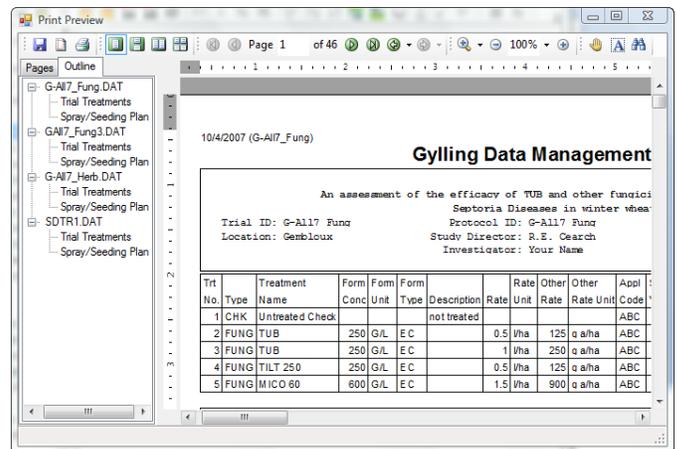
- Navigation bar shows new study editors, offering a simple one click method to view each editor.
- Split ARM desktop into horizontal or vertical panels, to display multiple editors.
- Schedule editor includes a grid view of tasks, to easily insert, move, and copy/paste tasks.
- New task categories of "Assigned to" and "Task length", with automatic assessment link to "Assessment Timing" for identifying completed tasks.

- Assessment editor includes a dockable properties dialog with auto-hide.
- Site description editor fully supports displaying and printing proportional fonts. Editor uses a new one row tab list to easily switch between tabs.
- Navigation bar at left lists all site description tabs in a fixed order (an often requested feature).
- Prompts and entry fields are aligned into logical columns on site description and protocol description.
- Prompt columns automatically adjust for different language translation prompt lengths.
- Site and protocol description editors use the current editor font (Tools - Options - Display), the same as other ARM study editors.



## Reports

- Adjusting margins or changing page orientation on Print Preview dialog automatically repaginates report.
- New choices to view report thumbnails, zoom, display pages, and select text on Print Preview.
- Print reports to Adobe PDF files with a single button click using included PDF writer.
- Tree view of reports and studies on Print Preview dialog, to easily display a selected report page.
- Automatically create a PDF copy of every printed report, to keep a permanent electronic record.
- Select treatments, assessment columns, and data header rows to print with simple mouse clicks.



## Automatic Backups

Study list file management features include automatic backup of study files, providing data protection against hardware problems or accidental study changes.

## Help

A new media clips toolbar icon and help menu choice offers easy access to short media clips demonstrating how to perform typical tasks in ARM. Users should require less training and support to use ARM 9 because of the interface and help enhancements.

## System Requirements

ARM 9 requirements are based on minimum software required to support Microsoft .NET 2.0 runtime, plus hardware to provide adequate software performance for typical tasks. Recommended system configuration is:

- Windows XP, Windows Vista, or Windows 7
- 1 GHz or faster processor
- 512 MB or more of RAM (2 GB minimum recommended for Vista and Windows 7)
- 400 MB available hard disk space
- 1024 x 768 or higher display resolution
- Mouse or pointing device
- CD-ROM or DVD-ROM to install program and license
- Printer

- Recommend one physically separate drive (USB flash drive, second hard drive, or network drive) for archiving and backing up ARM studies
- Optional USB connection for Psion Workabout Pro or other data collector
- Print to Excel, Push/Pull, and Report Link features require Microsoft Excel 2003 or newer
- Send To feature requires a MAPI-enabled email program such as Microsoft Outlook

### **Supported Software Versions Policy**

In general, GDM fully supports the current release version of software, and offers limited support for one previous version. For example, when ARM 8 was released in March 2008 it became the 'current release version', and ARM 7 became the 'previous version'. Thus ARM 7 became obsolete in 2012 when ARM 9 was released.

Please note that within a software version listed below, GDM gives free support only for the most recent free maintenance update. Users should always install the most recent free maintenance update before contacting GDM for support.

GDM goal is to support our clients using our software. Many software updates result from clients who share what they wish our software would do, and what new features would be nice to include. We also improve documentation and error handling based on support calls from researchers using our software.

### **GDM Free Software Support Policy**

\*\* GDM provides free support for installations that meet all 9 requirements described below:

1. The installation is your newest purchased ARM version;
2. The most recent released ARM maintenance update for that version is installed;
3. It is a GDM supported program version;
4. The program was installed from a GDM CD or the GDM website (not an unknown installation from another website, CD/DVD, or company);
5. It is installed on a stand-alone Windows PC (not running from a thin client);
6. The PC is running on current service pack of a supported Windows version (with Word, Excel, and Outlook to fully support all ARM features);
7. The Windows version was either pre-installed on a purchased PC, or installed from a Windows installation DVD/CD;
8. The ARM program is run from a Windows user account with all required user rights and permissions for ARM to work properly;
9. The Windows user account has permission to run the ARM Support Viewer (see Using the ARM Support Viewer for more information).

GDM charges \$150/hour for support on any system that does not meet all 9 conditions listed above. (Minimum time is 1 hour.)

Examples are for support issues that result from:

- Installing ARM on a Windows image built by corporate IT, or on Citrix or Terminal Server.
- Installing a corporate in-house version of an ARM customization on a cooperator or contractor PC when a cooperator/contractor version is available.
- Moving required ARM folders that are installed by ARM, such as study definition or program folders.
- There is limited support for GDM software installed on an Apple Macintosh computer, with free support only for questions about the GDM software. GDM cannot answer questions about Macintosh computers, Parallels emulator program, or a supported Windows version installed within Parallels.