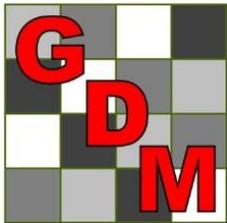


# ARM 9 Changes ver. 9.1.0 to 9.1.5

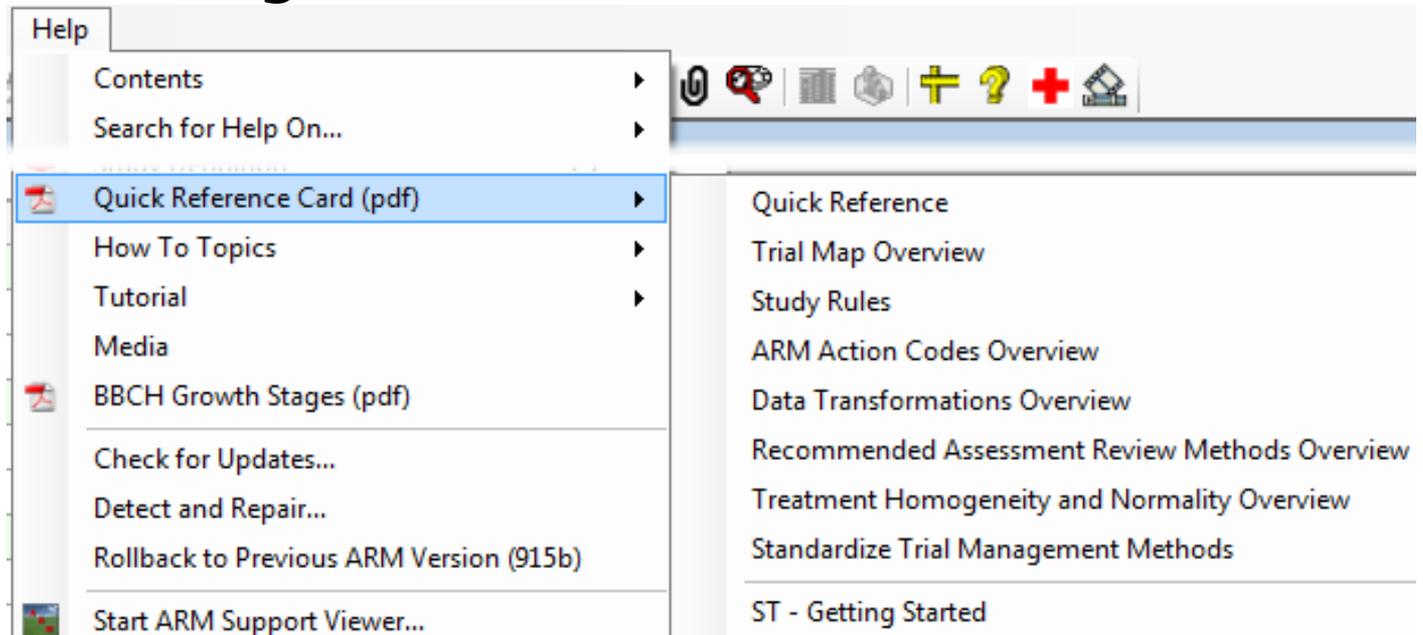
---



Gylling Data Management, Inc.

# Help Menu

- Expanded “Quick Reference (pdf)”
  - Quick Reference has more information
  - Training handouts are included



# Treatments Editor

- New grid to enter active ingredients while adding to a product list:

display list, add ingredients,

view on the properties panel

The main application window displays a table with columns: Treatment Name, Form Conc, Form Unit, Form Type, and Rate. The table contains three rows: 'Tolerant variety' (80, GG), 'Sure Kill' (75, %AW/W, DF), and another row. A yellow callout '1' points to the 'Sure Kill' row. Below the table, a 'Treatment Name Personal List' window is open, showing a search for 'ARM - Information' with a message: 'No matches found. Add item to list?'. A yellow callout '2' points to the 'Yes' button in this dialog.

The 'Active Ingredients Editor' dialog box contains a table with columns: No., Active Ingredient, and AI Conc. It lists three ingredients: 1. allgooduron (50), 2. nobadinol (25), and 3. Below the table, a red message reads: 'Enter ingredient information to store with new list item Sure Kill 75%AW/WDF'. A yellow callout '3' points to the table, and a yellow callout '4' points to the 'OK' button.

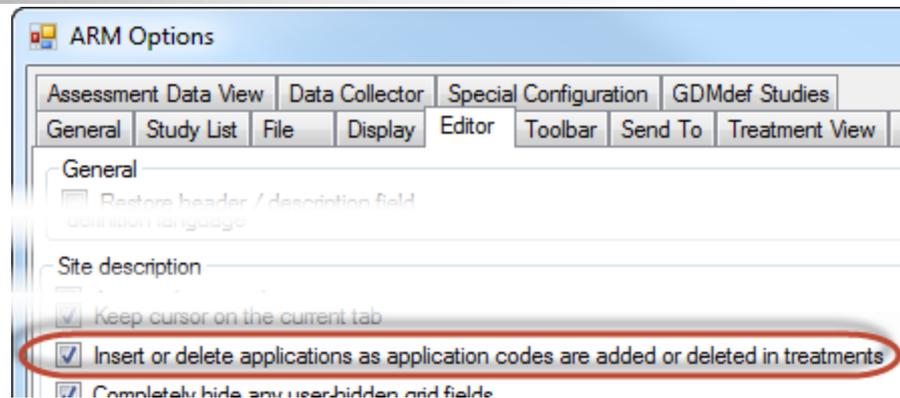
Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit
3	2	FUNG	Sure Kill	75	%AW/W	DF	250	g Al/ha
2	2	ADJ	NIS	100	%	SL	0.5	% V/V

Properties

Treatment Name	Form Conc	Rate	Rate Unit
allgooduron	50	167	Al/ha
nobadinol	25	83	g Al/ha

# Auto-Add Application Columns

- Controlled by Editor option (Tools – Options)
- Add new application C



Treatments - Line 15									
Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Appl Code
14	5	ADJ	NIS	100	%	SL	0.5	% V/V	B
15	5	HERB	Super Stomp	75	%AW/W	DF	375	g AI/ha	C
16	5	ADJ	NIS	100	%	SL	0.5	% V/V	

Site Description		
	A	B
Application Date:	Mar-29-2007	Apr-10-2007
Appl. Start Time:	8:00 AM	12:30 PM
Appl. Stop Time:		
Application Method:	SPRAY	SPRAY

Treatments - Line 16									
Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Appl Code
14	5	ADJ	NIS	100	%	SL	0.5	% V/V	B
15	5	HERB	Super Stomp	75	%AW/W	DF	375	g AI/ha	C
16	5	ADJ	NIS	100	%	SL	0.5	% V/V	

Site Description			
	A	B	C
Application Date:	Mar-29-2007	Apr-10-2007	
Appl. Start Time:	8:00 AM	12:30 PM	
Appl. Stop Time:			
Application Method:	SPRAY	SPRAY	

auto-adds  
column C

# Auto-Delete Blank Applications

- Delete column in site description

Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Appl Code
14	5	ADJ	NIS	100	%	SL	0.5	% V/V	B
15	5	HERB	Super Stomp	75	%AW/W	DF	375	g AI/ha	C
16	5	ADJ	NIS	100	%	SL	0.5	% V/V	

Properties

Site Description

Contacts | Crop Description | Pest Description | Site and Design | Maintenance

	A	B	C
Application Date:	Mar-29-2007	Apr-10-2007	
Appl. Start Time:	8:00 AM	12:30 PM	
Appl. Stop Time:			
Application Method:	SPRAY	SPRAY	
Application Timing:	EAPOCR	EAPOCR	
Application Placement:	SURFAC	SURFAC	
Applied By:			
Air Temperature, Unit:	60 F	65 F	
% Relative Humidity:	55	50	

- Undo Typing
- Cut
- Copy
- Copy Current
- Paste
- Insert Repeating Section...
- Delete Repeating Section...

**ARM - SPECIAL CONFIRMATION**

 Do you wish to adjust the deleted application code C in treatment field 'Appl Code'?

Select 'Yes' to change C to B.  
 Select 'No' to remove C from treatment field 'Appl Code'.  
 Select 'Cancel' if ARM should not change application code C in treatments.

Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Appl Code
14	5	ADJ	NIS	100	%	SL	0.5	% V/V	B
15	5	HERB	Super Stomp	75	%AW/W	DF	375	g AI/ha	B
16	5	ADJ	NIS	100	%	SL	0.5	% V/V	

# Assessment Data Images

## ■ More 'Rename images' choices

Image Import Preview

Direction

By column across 'Plot'

Across columns within 'Plot'

Columns:

Sort order

'Plot' experimental unit

Treatment

Number of images per 'Plot' an assessment column:

Copy to trial folder  Rename image

File name components

Trial ID:   Plot:

Trt:   Sub:

Asm. Date:

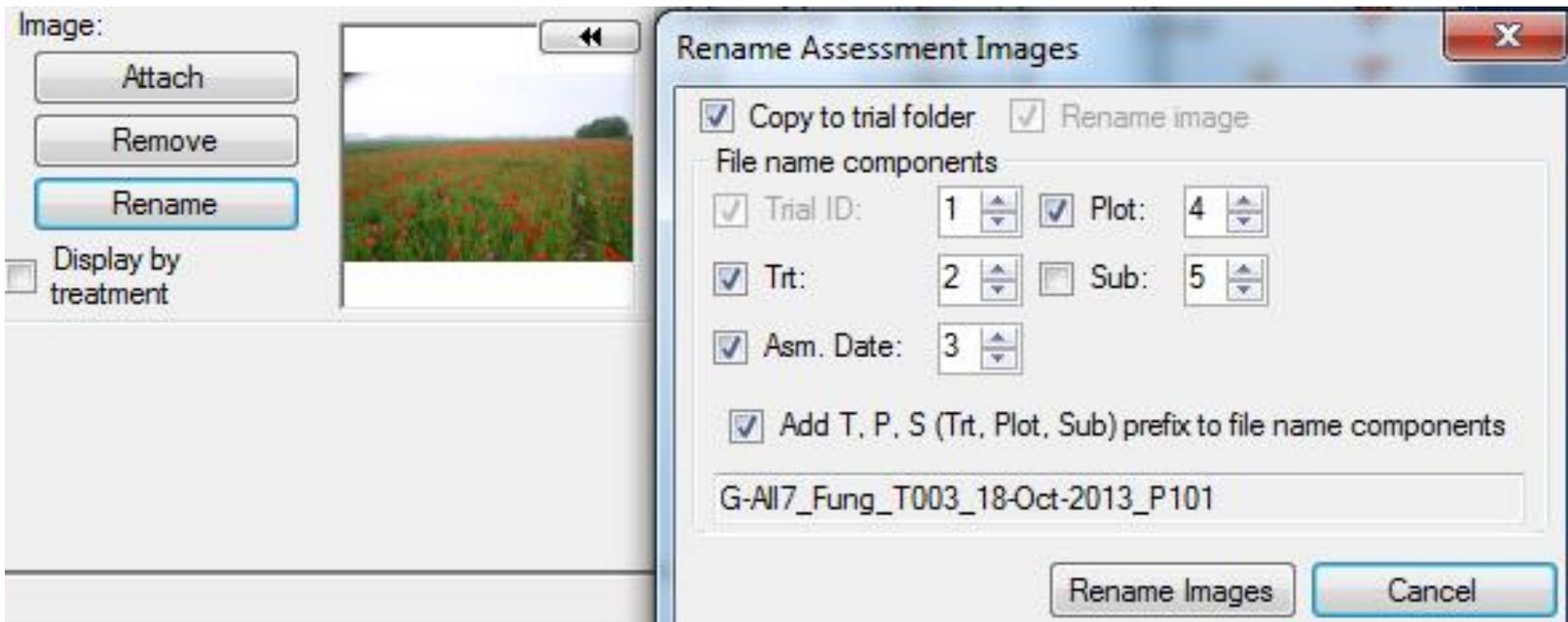
Add T, P, S (Trt, Plot, Sub) prefix to file name components

G-A117\_Fung\_T003\_18-Jun-2013\_P101

\*Images are automatically renamed at save when any file name component changes

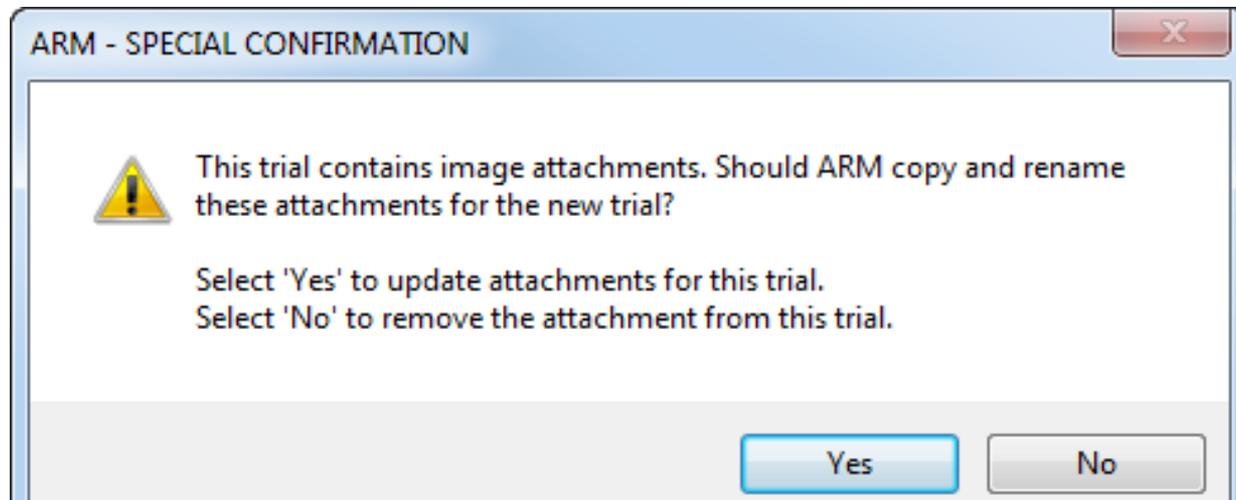
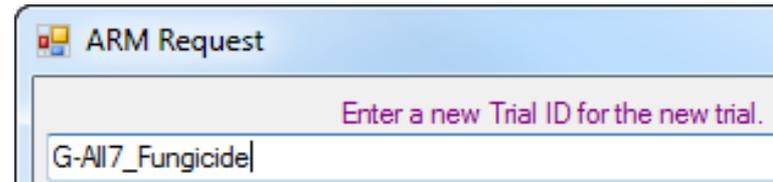
# Assessment Data Images

- 'Rename' button to modify names of existing attached images



# Assessment Data Images

- When 'Save As' to copy a trial:
  - Are asked to also change Trial ID
  - Also whether to copy and rename images



# Assessment Data Editor

- Red line displays in damaged plots

Rest stage at Appl.  
Appl. Equipment  
Treatment Appl.  
Notes  
Deviations  
Protocol Comments  
Assessment Data  
Trial Map  
Schedule Tasks

+	Sub	Rp	Bk	Col	Plot	△	Trit	5
🔒	6	1	1	1	101	3		1.00
	7	1	1	1	101	3		0.00
	8	1	1	1	101	3		0.00
	9	1	1	1	101	3		3.00
	10	1	1	1	101	3		5.00
	1	1	1	2	102	1	27.7	
	2	1	1	2	102	1		6.00

Assessment (Plot 102, Col 5)  
Comment:  
Barcode:  
GPS:  
 Damaged

Rest stage at Appl.  
Appl. Equipment  
Treatment Appl.  
Notes  
Deviations  
Protocol Comments  
Assessment Data  
Trial Map  
Schedule Tasks

+	Sub	Rp	Bk	Col	Plot	△	Trit	5
🔒	6	1	1	1	101	3		1.00
	7	1	1	1	101	3		0.00
	8	1	1	1	101	3		0.00
	9	1	1	1	101	3		3.00
	10	1	1	1	101	3		5.00
	1	1	1	2	102	1	27.7	
	2	1	1	2	102	1		6.00

Assessment (Plot 102, Col 5)  
Comment:  
Barcode:  
GPS:  
 Damaged

# 'Plot' Experimental Unit Description

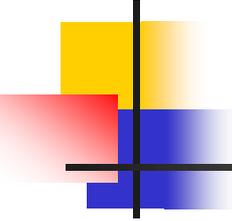
- Is "locked" by default to prevent accidental changes (at lower left of Assessment Data editor)
  - ***Italic*** text indicates read-only state
  - Click padlock to allow  or end  edits

Toggle the read-only property of the 'Plot' description columns (Read-only columns display in italics).

	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>101</i>	<i>1</i>		
	1	1	1	1	101	1		

Toggle the read-only property of the 'Plot' description columns (Read-only columns display in italics).

	1	1	1	1	101	1		
	1	1	1	1	101	1		



# Data Transformations

---

- Henderson-Tilton: when multiple checks, all checks forced to 0% (like Abbott)
- User-defined transformations that make all calculations on treatment means are now non-analyzable “NM” on summaries:  
@TTABR/@TTAB, @TUPOCR/@TUPOC,  
@TTHT, @ITAB, @RA, @RA2, @REL,  
@RELR, @RELS, @THT, @TSO

# Trial Map Enhancements

Displays wider factor level description codes and plot numbers

Assessment Data:

Sub	Rp	Bk	Col	Plot	Trt	Alt Plot ID	Barcode
1	1	1	1	A-00001		3 A-00001	
1	1	1	2	A-00002		4 A-00002	
1	1	1	3	A-00003		2 A-00003	

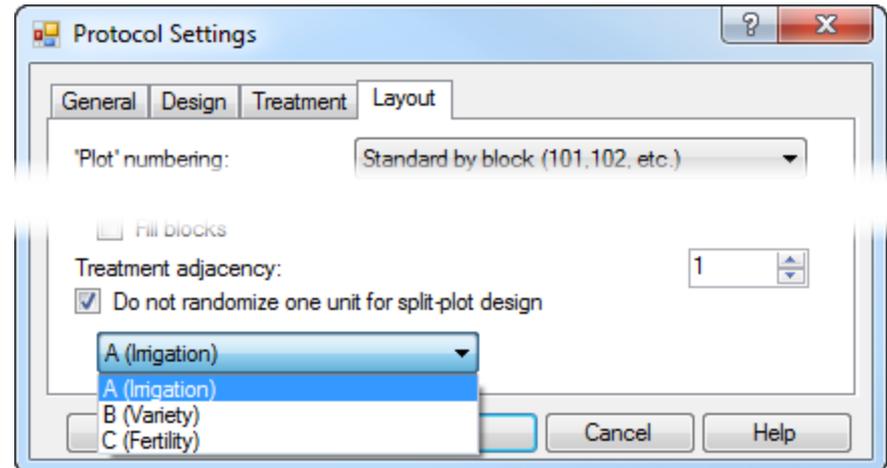
Auto-sizes plot font for up to 8 letters wide

The screenshot shows the 'Trial Map' application window. At the top, there are navigation icons and a zoom level of 150%. Below this is a grid of plot cards. Each card displays a plot ID (e.g., A-00001), a factor level (e.g., 3), and a treatment description (e.g., Optimal V34 None). Red circles highlight the plot IDs, the factor levels, and the treatment descriptions on the cards. Below the map is a data table with columns for Options, Movement Arrows, Treatment Description, and Level Description. The table contains data for factors A, B, and C at levels 1 and 2, with corresponding level codes and descriptions. Red circles highlight the 'Alt Plot ID' column in the table above, the 'Level Code' column in the table below, and the 'Level Description' column header in the table below.

Options	Movement Arrows	Treatment Description	Level Description
Factor	Level	Level Code	Description
A	1	Optimal	Optimal Irrigation
A	2	Deficit	Deficit Irrigation
A	3	Dry	Dryland Irrigation
B	1	V12	V12
B	2	V34	V34
C	1	None	None
C	2	Recomend	Recommended

# Settings - Design

- Define any split-plot factor to not randomize
- Use when it is not feasible to “apply” factor when randomized: irrigation, wide cultivation or seeding equipment



# Site Description Editor

## ■ Paste-fill in site description grids

Application Description

	A	B
1 Application Date:	Apr-15-2013	
Application Method:	SPRAY	
Application Timing:	POSPOS	
Application Placement:	BROFOL	
Applied By:		
Air Temperature, Unit:	17 C	
% Relative Humidity:		
Wind Velocity, Unit:		
Wind Direction:		

Application Description

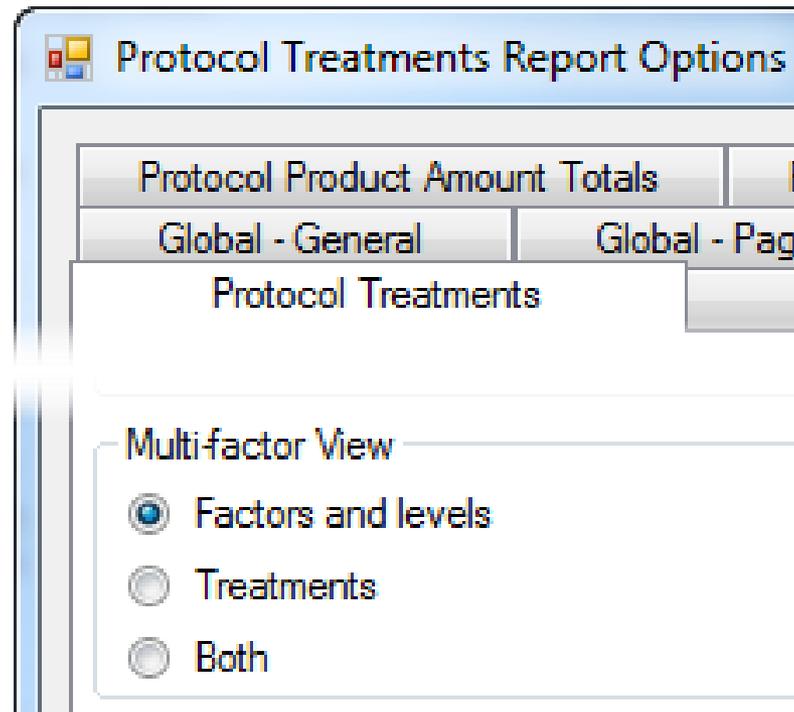
	A	B	C	D	E	F
2 Application Date:	Apr-15-2013					
Application Method:	SPRAY					
Application Timing:	POSPOS					
Application Placement:	BROFOL					
Applied By:						
Air Temperature, Unit:	17 C					
% Relative Humidity:						
Wind Velocity, Unit:						
Wind Direction:						

Application Description

	A	B	C	D	E	F
3 Application Date:	Apr-15-2013					
Application Method:	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:	POSPOS	POSPOS	POSPOS	POSPOS	POSPOS	POSPOS
Application Placement:	BROFOL	BROFOL	BROFOL	BROFOL	BROFOL	BROFOL
Applied By:						
Air Temperature, Unit:	17 C					
% Relative Humidity:						
Wind Velocity, Unit:						
Wind Direction:						

# New Treatment Reports Option for Multi-Factor Studies

- Protocol Treatments



# New Treatment Reports Option for Multi-Factor Studies

- Trial Treatments

Trial Treatments Report Options

Product Amount Totals    Pre-mix Ingredient

Global - General    Global - Page Heading

Trial Treatments    Trial Treatments

Multi-factor View

- Factors and levels
  - From entered fields in the original protocol
  - From first occurrence of each factor and level in trial
- Treatments
- Both

# New Treatment Reports Option for Multi-Factor Studies

- Define whether to list:
  - Levels of each factor  
(like protocol Treatments editor)

Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Growth Stage	Appl Code
Factor A (Herbicide)									
1	HERB	Tub	500	g/L	EC				
2	HERB	Tilt	600	g/L	EC				
Factor B (Rate)									
1		Low rate				25	g ai/ha		
2		High rate				50	g ai/ha		
Factor C (Stage)									
1		Early						E APOCR	A
2		Late						LAPOCR	B

# New Treatment Reports Option for Multi-Factor Studies

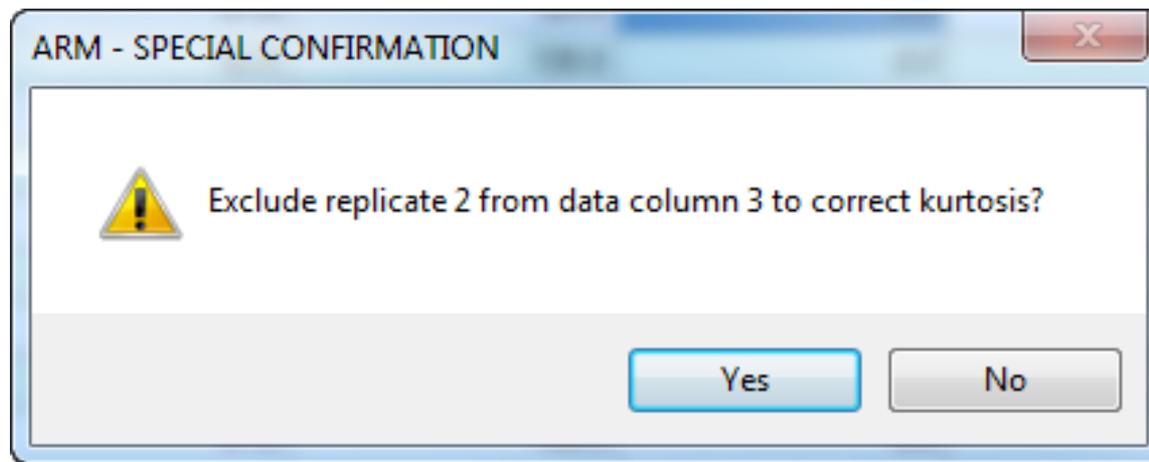
- “Multiplied-out” treatment list  
(the current ARM option)

Trt No.	Type	Treatment Name	Fom Conc	Form Unit	Form Type	Rate	Rate Unit	Growth Stage	Appl Code
1	HERB	Tub Lowrate Early	500	g/L	E C	25	g ai/ha	E APOCR	A
						25	g ai/ha	E APOCR	A
2	HERB	Tub Lowrate Late	500	g/L	E C	25	g ai/ha	LAPOCR	B
						25	g ai/ha	LAPOCR	B
3	HERB	Tub High rate Early	500	g/L	E C	50	g ai/ha	E APOCR	A
						50	g ai/ha	E APOCR	A
4	HERB	Tub High rate Late	500	g/L	E C	50	g ai/ha	LAPOCR	B
						50	g ai/ha	LAPOCR	B
5	HERB	Tilt Lowrate Early	600	g/L	E C	25	g ai/ha	E APOCR	A
						25	g ai/ha	E APOCR	A
6	HERB	Tilt Lowrate Late	600	g/L	E C	25	g ai/ha	LAPOCR	B
						25	g ai/ha	LAPOCR	B
7	HERB	Tilt High rate Early	600	g/L	E C	50	g ai/ha	E APOCR	A
						50	g ai/ha	E APOCR	A
8	HERB	Tilt High rate Late	600	g/L	E C	50	g ai/ha	LAPOCR	B
						50	g ai/ha	LAPOCR	B

- Both formats

# Heterogeneity/Skewness/ Kurtosis on Summary Reports

- Exclude one replicate
  - ERn=Exclude Replicate 'n':  
ER2 to exclude replicate number 2



3 DA-B
ER2
1
3
0.0 b
0.0 b
99.3 a
99.7 a
100.0 a

Excluded replicate 2 in column 3

# AOV Means Table Report

- Define mean symbol when AOV cannot detect significant differences between means (previously was always 'a')

AOV Means Table Report Options

Pre-mix Ingredient    Fields to Print    Global - General

AOV Means Table Report Options    General Sumr

Mean comparison test

Test: Student-Newman-Keuls

Significance level: 5%

Use FAOV complete error for split-plot trials

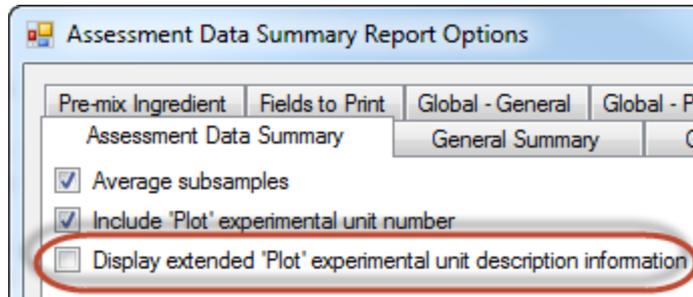
Only when significant AOV treatment P(F)

Symbol indicating no significant difference between treatment means: --

Rating Type			PHYGEN
Rating Unit			%
Trt No.	Treatment Name	Rate Unit Code	
1	Untreated Check	ABC	0.0 --
2	TUB	0.5 l/ha ABC	0.0 --
3	TUB	1 l/ha ABC	0.0 --
4	TILT 250	0.5 l/ha ABC	0.0 --
5	MICO 60 FUNGOL	1.5 l/ha AB 1.25 l/ha C	0.0 --
Treatment F			0.000
Treatment Prob(F)			1.0000

# Other Report Changes

- Include images in reports printed to Excel (Trial Map, Assessment Map, etc.)
- Assessment Data Summary report option prints extended plot information columns

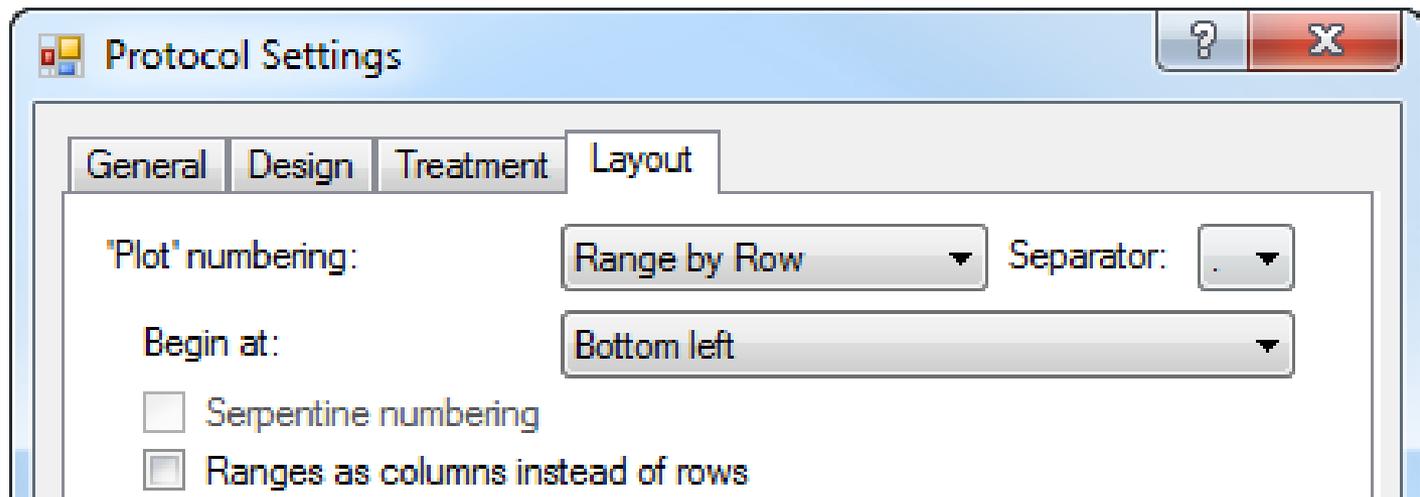


Sub	Plot	Tit	Alt Plot ID	Lat	Long
1	A1	1	A1	50.5667	4.6833
1	A2	1	A2		

3 TUB	A1	50.5667	4.6833	0.0
	B2			0.0
	301			0.0
	402			0.0
			Mean =	0.0

# Create Protocol – Layout tab

- 'Range by Row' plot numbering uses trial map row & column as plot numbers (frequently used in variety trials)



# Create Protocol – Layout tab

- Range by Row plot numbers display on:

- Trial Map
- Assessment Editor
- Reports

4.1 1	4.2 3	4.3 2	4.4 5	4.5 4
3.1 5	3.2 1	3.3 4	3.4 2	3.5 3

Trt No.	Rep 1	2	3	4	Notes
1	1.1	2.4	3.2	4.1	
2	1.2	2.3	3.4	4.3	
3	1.3	2.1	3.5	4.2	
4	1.4	2.5	3.3	4.5	
5	1.5	2.2	3.1	4.4	

+	Sub	Rp	Bk	Col	Plot $\Delta$	Trt
🔒	1	1	1	1	1.1	1
	1	1	1	2	1.2	2
	1	1	1	3	1.3	3
	1	1	1	4	1.4	4
	1	1	1	5	1.5	5
	1	2	2	1	2.1	3

# Create Protocol – Layout tab

- Define very large plot numbers

**Trial Settings**

General | Design | Treatment | **Layout**

'Plot' numbering: Standard by block (101,102, etc.)

Begin at: Bottom left

Serpentine numbering

Blocks as columns instead of rows

Non-randomized replicate: 1

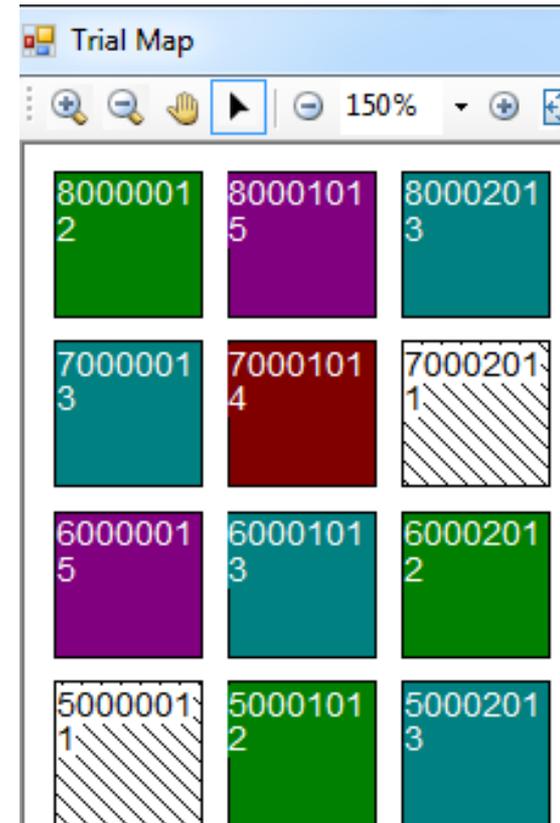
Starting block number: 50000

Increment between blocks: 10000

Buffer between blocks: 1

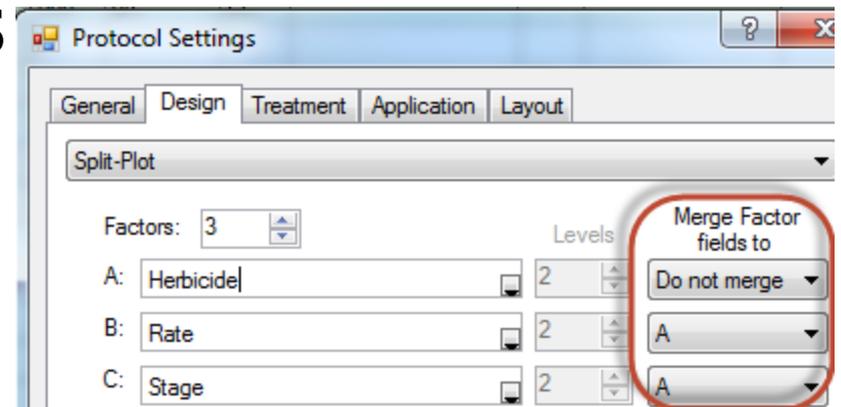
Starting 'Plot' experimental unit number offset: 1

Increment between 'Plot' experimental unit numbers: 100



# Create Trial - Merge Factor to

- New Settings option to define auto-merge actions for combining factors when creating a multi-factor trial (e.g. copying rates or growth stages to factor that defines tested products)



# Create Trial - Merge Factor to

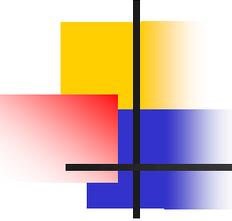
- These protocol treatments:

Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Growth Stage	Appl Code
1			Start of Factor A (Herbicide)							
2	1	HERB	Tub	500	g/L	EC				
3	2	HERB	Tilt	600	g/L	EC				
4			Start of Factor B (Rate)							
5	1		Low rate				25	g Al/ha		
6	2		High rate				50	g Al/ha		
7			Start of Factor C (Stage)							
8	1		Early						EAPOCR	A
9	2		Late						LAPOCR	B

# Create Trial - Merge Factor to

- Result in these trial treatments

Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Growth Stage	Appl Code	Factor ID	Level No.
1	1	HERB	Tub	500	g/L	EC	25	g AI/ha	EAPOCR	A	A	1
2	1		Low rate				25	g AI/ha			B	1
3	1		Early						EAPOCR	A	C	1
4	2	HERB	Tub	500	g/L	EC	25	g AI/ha	LAPOCR	B	A	1
5	2		Low rate				25	g AI/ha			B	1
6	2		Late						LAPOCR	B	C	2
7	3	HERB	Tub	500	g/L	EC	50	g AI/ha	EAPOCR	A	A	1
18	6		Late						LAPOCR	B	C	2
19	7	HERB	Tilt	600	g/L	EC	50	g AI/ha	EAPOCR	A	A	2
20	7		High rate				50	g AI/ha			B	2
21	7		Early						EAPOCR	A	C	1
22	8	HERB	Tilt	600	g/L	EC	50	g AI/ha	LAPOCR	B	A	2
23	8		High rate				50	g AI/ha			B	2
24	8		Late						LAPOCR	B	C	2



# Tasks

---

- Outlook Appointment starting time used as the starting time for tasks ARM creates in Outlook.
- Saves 'Selected Studies' for current Master Calendar as default the next time ARM is opened.

# Study Rules

- Now anyone can add rules to a study
  - Use 'Permissions' to set who can edit rules
  - Protocol author can change all rules

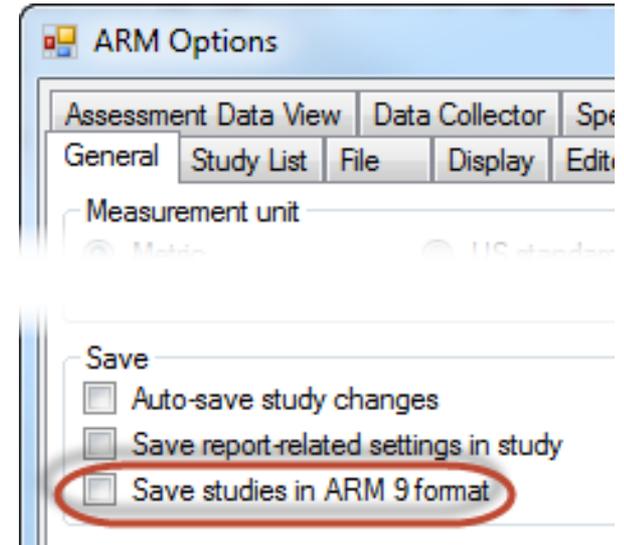
Allows contractors to add rules for in-house staff with contracted trials

Study Rules						
Rule	Rule ID	Editor	Field	Condition	Permissions	Rule Details
1	Required	Site Description	General Trial - Latitude of LL Corner °	one-year/interim	Me and my deputies	required for site visit
2	Required	Site Description	General Trial - Longitude of LL Corner °	one-year/interim	Me and my deputies	required for site visit
3	Recommended	Site Description	Soil - Fertility Level	one-year/final/m	Me and my deputies	used to group trials f
4	Recommended	Site Description	Moisture - Overall Moisture Conditions	one-year/final/m	Me and my deputies	used to group trials f

# Tools – Options, General tab

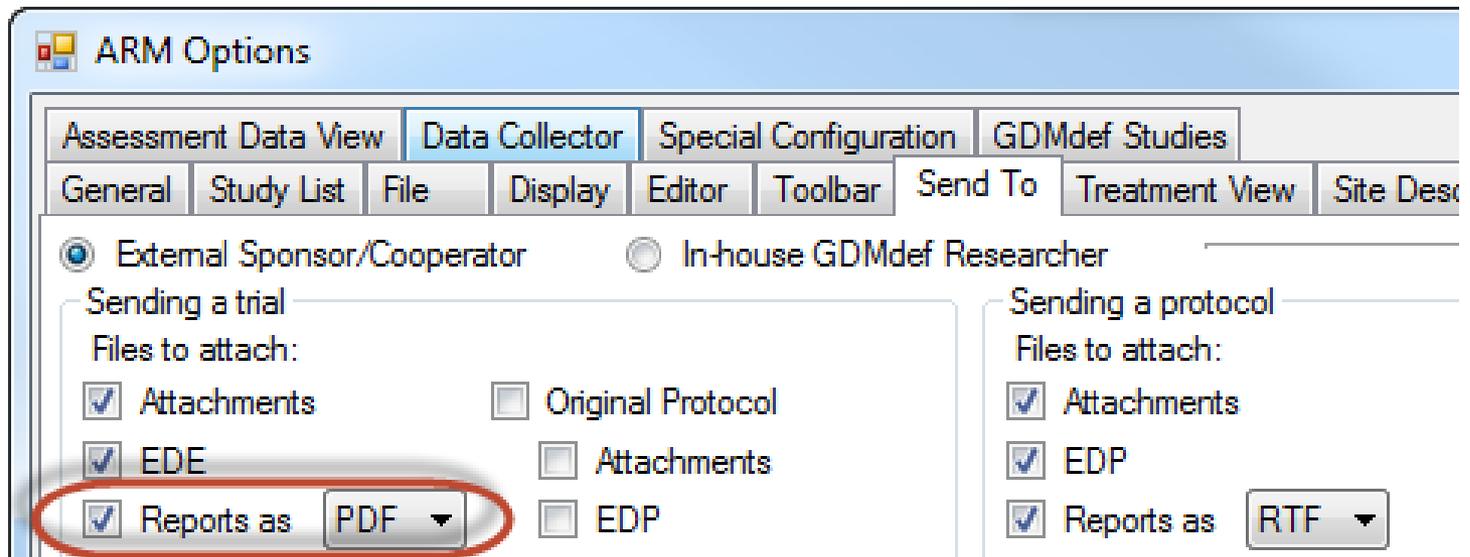
Automatically save studies in ARM 9 format

- Creates protocols and trials as .prt9/.dat9
- Avoids prompting to save in ARM 9 format to keep all information when is currently in .prt8/.dat8 format



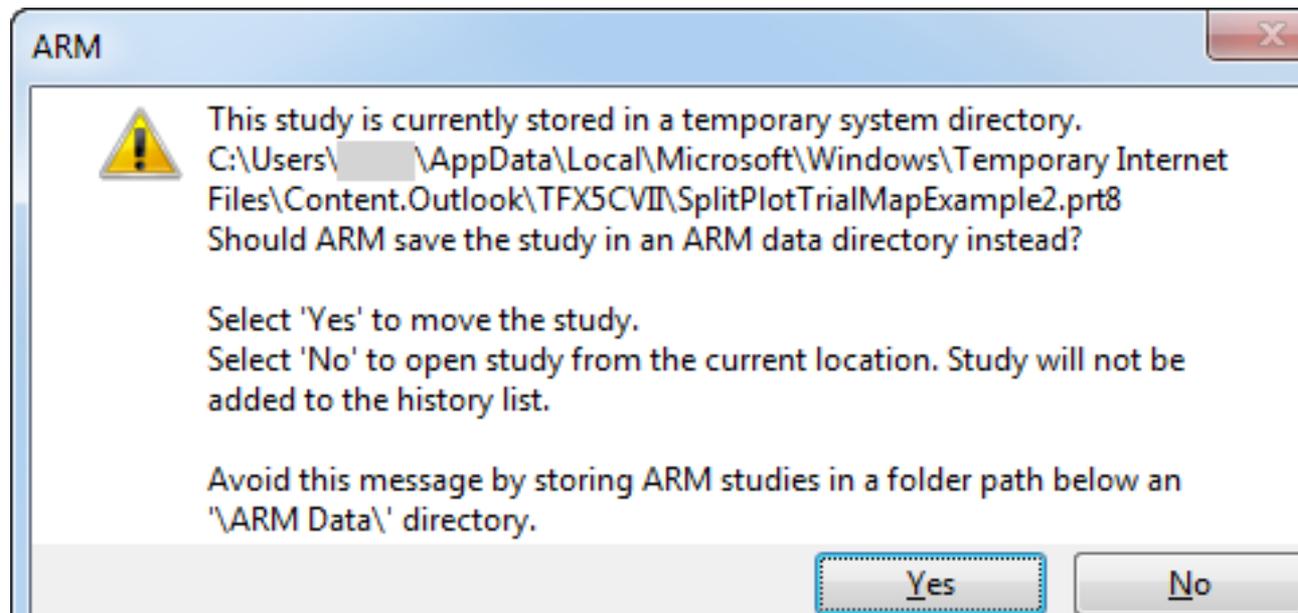
# Tools – Options, Send To tab

- Option to attach reports in PDF format when sending trial results or a protocol by e-mail

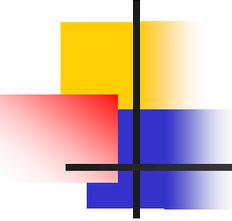


# File – Open

- When ARM is copying a study from a temporary location to study directory, any read-only protection is removed







# Summary Across Trials 8

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- Summaries with large number of data columns, or of trials with many missing data points, are now  $\sim 10x$  faster
- “Display AOV Means Comparison letter” graph options are active
- Analyze one replicate strip/demo trials
- Summary Report option to include adjusted treatment means