

# ARM 2019 Enhancements

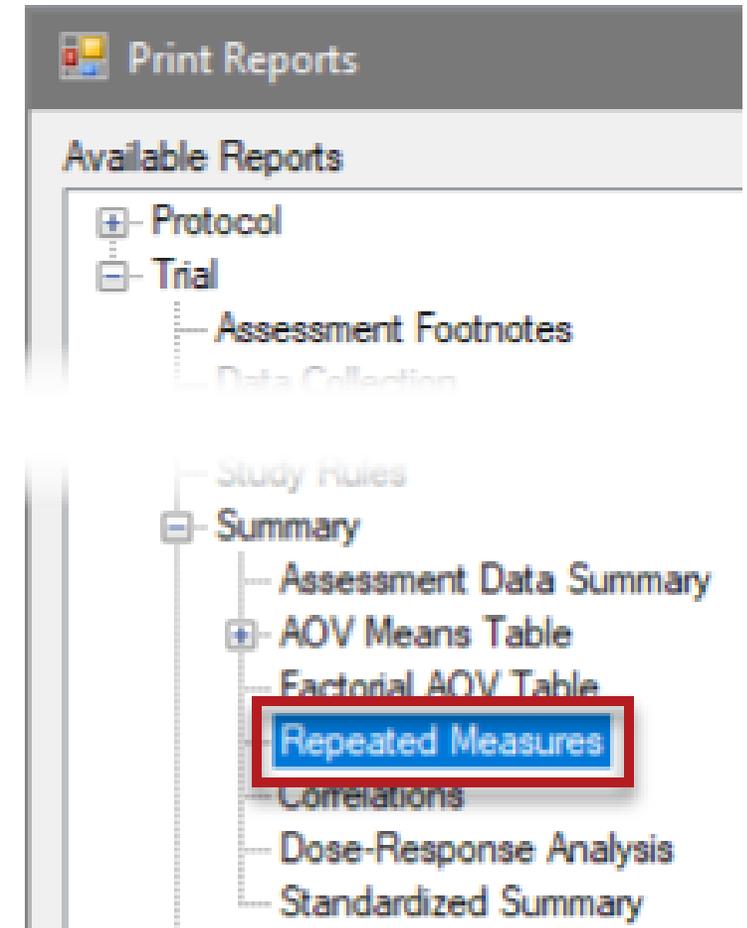
# Repeated Measures

# Repeated Measures

## Analyze repeated assessments across time

### Enhancement

- Powerful statistical analysis which enable the control of factors which cause variability between treatments over time.
- Provides analysis of treatment means over time to determine if there is an overall time effect on the treatments performance.



# Repeated Measures

## Define assessments for analysis:

1. Select a column to find potential repeated assessments.
2. ARM proposes fields to match other columns.
3. Diagnose issues with column selection.
4. Or load from history of column matches.

Assessment Data - Line 1

Column Number	1	2	3	4	5
Pest Type	Disease	Disease	Disease	Disease	Disease
Pest Code	ERYSGT	ERYSGT	ERYSGT	ERYSGT	ERYSGT
Pest Name	Powdery mildew of whe	Powdery mildew o			
Crop Code	TRZAW	TRZAW	TRZAW	TRZAW	TRZAW
Crop Name	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Winter wheat
Rating Date	Jun-8-2014	Jun-22-2014	Jul-5-2014	Jul-19-2014	Aug-3-2014
Part Rated	PLANT P	PLANT P	PLANT P	PLANT P	PLANT P
Rating Type	COUDIS	COUDIS	COUDIS	COUDIS	COUDIS
Rating Unit	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
Number of Subsamples	1	1	1	1	1
ARM Action Codes					

Define Data Column Matches for Repeated Measures

Heading	Matched Fields	Warnings:	Previous column matches
Pest Code	ERYSGT	Selected assessments have inconsistent intervals of 14, 13, 14, 15 days.	Selected column fields
Crop Code			
Rating Date			
Part Rated			
Rating Type	COUDIS	Instructions	
Rating Unit	PERCENT	Modify the matched columns by clicking a new column to match, selecting a previous match or editing the 'Matched Fields'.	
ARM Action Codes		Click 'View Selected' to view only the selected columns.	
		Click 'Next' to continue.	

Columns matched: 1-5

View Selected Next Cancel Graph Options... Help

	Repeated Measure
1 Pest Code=SEPTTR; Rating Type=PESSEV; Rating Unit=%	
2 Pest Code=ERYSGT; Rating Type=COUDIS	Repeated Measure
3 Pest Code=ERYSGT; Rating Type=COUDIS	Repeated Measure
4 Pest Code=PHYTHB; Crop Code=ZEAMD; Rating Type=DILOGR; Rating Unit=%	G-AI7_SDTR_Inoc_001
5 Pest Code=ERYSGT; Rating Type=COUDIS; Rating Unit=PERCENT	AUDPC_1

# Repeated Measures

Means and comparison letters for:

- Treatments Rating Dates
- Treatment x Rating Date interaction

Apply correction to adjust for correlation (H-F-L or G-G)

Repeated Measures AOV table

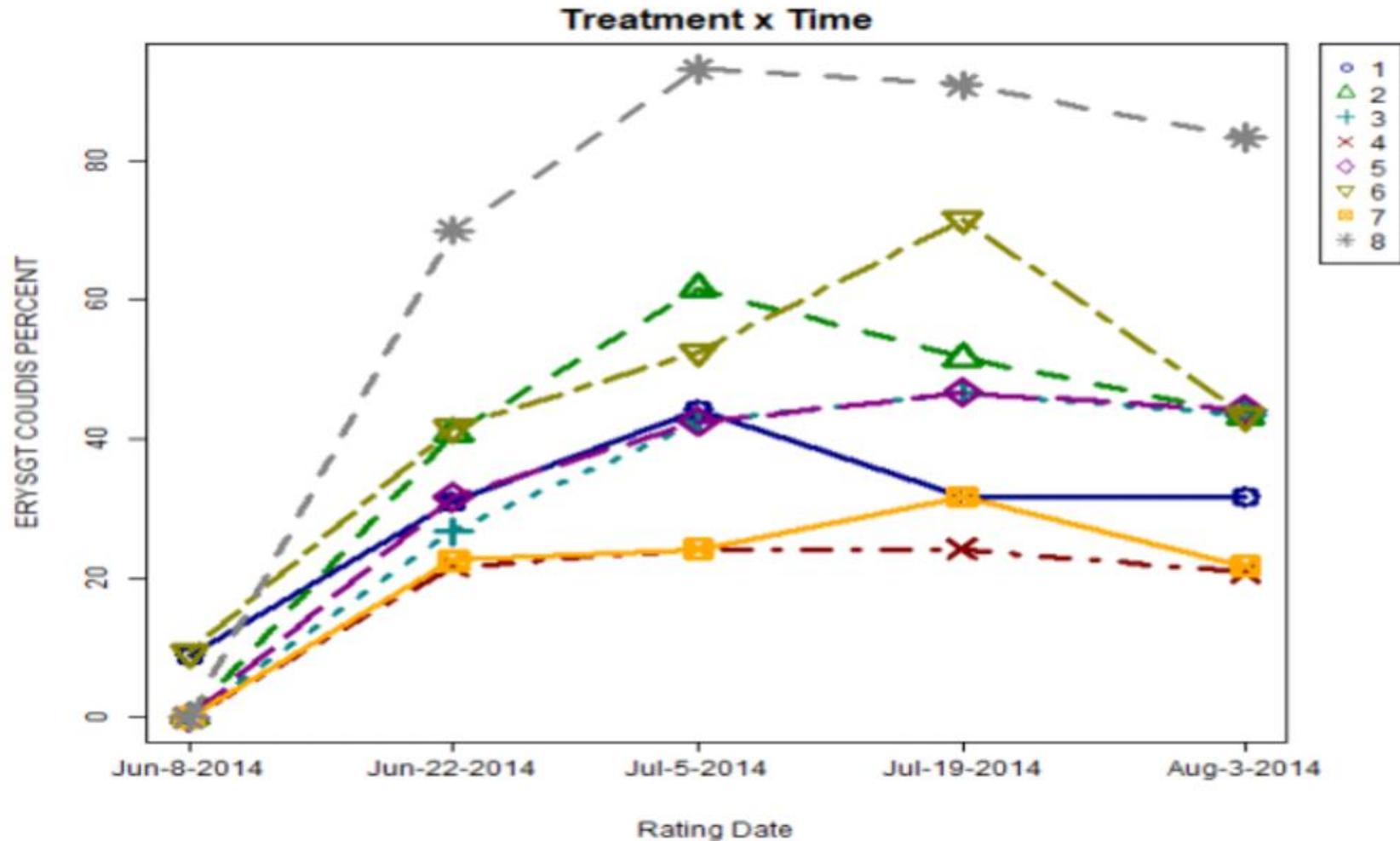
REPEATED MEASURES AOV For D ERYSGT Blumeria graminis tritici Powdery mildew of wheat TRZAW							
PLANT P COUDIS PERCENT 1							
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	HSD (.05)	Variance
Total	220.0	141626.962500					
Replicate	5.0	65.637500	13.127500	3.127	0.0195		0.223238
Treatment	7.0	51065.995833	7295.142262	1737.776	0.0001	1.70	
Treatment Error	35.0	146.929167	4.197976				-0.246155
Rating Date	3.6	71570.358333	17892.589583	3295.895	0.0001	1.31	
Treatment x Rating Date	25.1	17909.441667	639.622917	117.821	0.0001	5.35	
Error/Residual	143.6	868.600000	5.428750				5.428751

Pest Code	ERYSGT			
Pest Name	mildew of wheat			
Crop Code	TRZAW			
Crop Name	Winter wheat			
Part Rated	PLANT P			
Rating Type	COUDIS			
Rating Unit	PERCENT			
Number of Subsamples	1			
Trt No.	Treatment Name	Rate	Appl Code	
		Rate Unit		
TABLE OF Treatment MEANS				
1	Sure Kill	3 lb ai/a	A	29.4 f
2	Sure Kill	3 lb ai/a	A	39.5 c
3	Sure Kill	3 lb ai/a	A	31.8 e
4	Sure Kill	3.5 lb ai/a	A	18.2 h
5	Sure Kill	3 lb ai/a	A	33.0 d
6	Sure Kill	4 lb ai/a	A	43.7 b
7	Super Stomp	2.5 lb ai/a	A	20.0 g
8	Untreated			67.5 a
Error DF Correction (H-F-L)				
Tukey's HSD P=.05				1.70
Standard Deviation				2.05
CV				5.79
TABLE OF Rating Date MEANS				
1	Jun-8-2014 (Data Col 1)			2.3 e
2	Jun-22-2014 (Data Col 2)			35.7 d
3	Jul-5-2014 (Data Col 3)			48.1 b
4	Jul-19-2014 (Data Col 4)			49.4 a
5	Aug-3-2014 (Data Col 5)			41.5 c
Error DF Correction (H-F-L)				
Tukey's HSD P=.05				0.90
Standard Deviation				1.31
CV				2.33
TABLE OF Treatment Rating Date MEANS				
1	Sure Kill	3 lb ai/a	A	8.8 o
1	Jun-8-2014 (Data Col 1)			
2	Sure Kill	3 lb ai/a	A	0.0 p
2	Super Stomp	1.5 lb ai/a	A	

# Repeated Measures

## Treatment x Time Graph

- Plot treatment means over time.
- Visually identify treatment interaction across assessment dates.



# SE Definitions

# SE Definitions

## Plan and define standard evaluations (SEs) and tasks to use in the study

- Simpler than importing SEs from file into assessment data editor

Use Tools > 'Build Headers' and 'Build Tasks' to create the SEs and tasks defined in this tab

## Multiple rating timings create columns and tasks for each timing code

- Two-column SE F097\_C2 times 3 rating timings A1-A3 = 6 total data columns

### SE Definitions

Insert SE Definition with Shift+F7, Delete current SE Definition with Shift+F8

	1.		2.	
Rating Timing	A1-A3		H1	
SE Name	F097_C2		Y085	
SE Description	% of infected leaves (N leaves). TIO[x]* (note: *x = column nb of infected leaves in F097A)		Fresh yield grain in kg / ... m2	
Part Rated	LEAF		GRAIN	
Rating Type	PESINC		WEIFRE	
Rating Unit	%		KG	
Sample Size		LEAF		M2
Collection Basis		SHOOT	1	PLOT
Reporting Basis		LEAF		M2
Number of Subsamples				
ARM Action Codes	TIO[1]			
Pest Type, Code				
Crop Code				

# SE Definitions

1. Display SE Name list
2. Select an SE, can search/filter descriptions
3. Preview assessment columns defined in SE

Can also define tasks on this tab to add to Schedule editor

Site Description

### SE Definitions

Insert SE Definition with Shift+F7, Delete current SE Definition with Shift+F8

Rating Timing: [Dropdown]

SE Name: [Search Field]

#### SE Name Master List (SE\_TABLE)

SE Name	SE Description
F088	% Disease on surface of leaf 1
F089	% Disease on surface of leaf 2
F090	% Disease on surface of leaf 3
F091	% Disease on surface of leaf 4
F092	% Disease on surface of leaf 5
F093_C2	% of infected stems (N stems). (x/N)*100 (note: 'x = column
F094_C3	% of infected pods (n plants) (F094B / F094A)*100
F095_C2	% of infected leaves (N leaves). (x/N)*100 (note: 'x = colum
F096_C2	% of infected leaves (N leaves). (x/N)*100 (note: 'x = colum
F097_C2	% of infected leaves (N leaves). TIO[x]* (note: 'x = column r
F098_C5	% of infected fruits - Disease index: (((F098A)+2*[F098B]+3*[
F099_C5	% of fruits with Russeting - Disease index: (((F099A)+2*[F099
F100_C2	% of infected leaves (N leaves). TIO[x]* (note: 'x = column r
F101_C2	% of infected bunches (N bunches): (x/N)*100 (note: 'x = c
F102_C2	% of infected bunches (N bunches). TIO[x]* (note: 'x = colu
F103	Count of spots per plant

#### Preview

Column Number	1	2
SE Name	F097A	F097_C2
Part Rated	LEAF	LEAF
Rating Type	PESSEV	PESINC
Rating Unit	%AREA	
Sample Size, Unit	LEAF	LEAF
Collection Basis, Unit	SHOOT	SHOOT
Reporting Basis, Unit	LEAF	LEAF
ARM Action Codes		TIO[1]

(All) [Filter Icon] (All)

Active Filter: [Field]

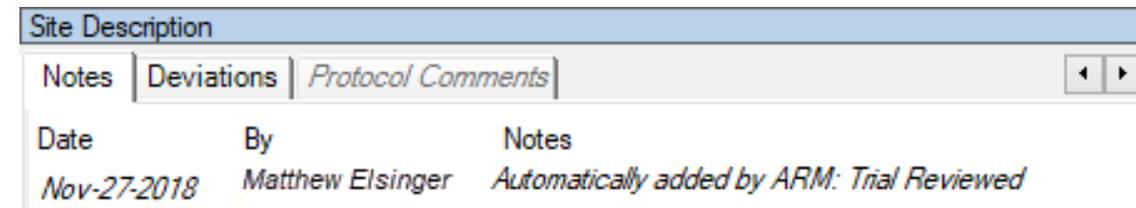
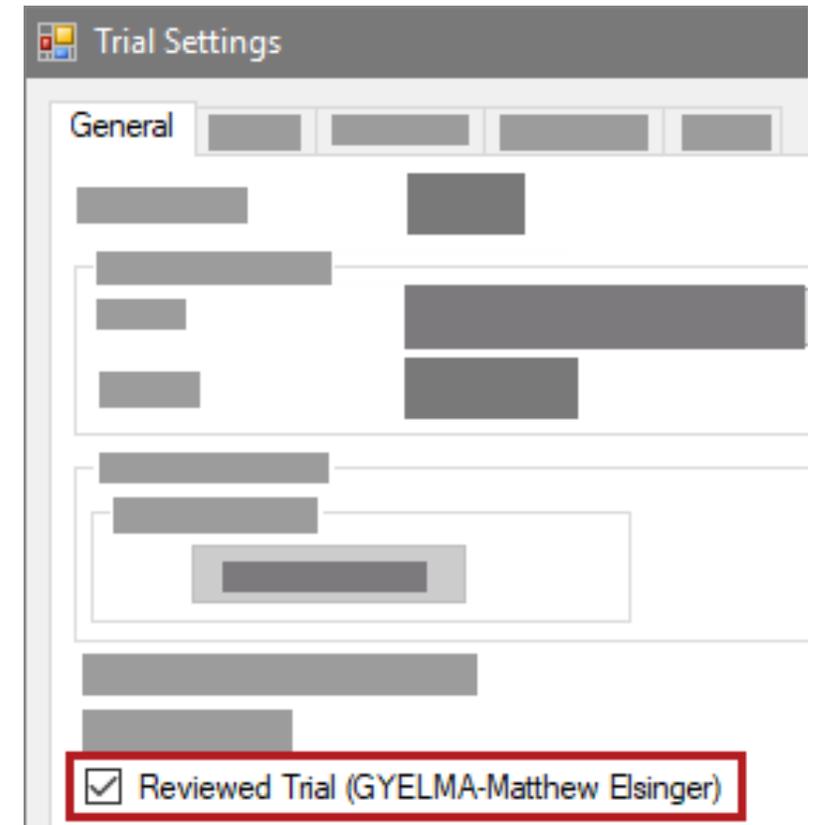
Remove Filter | Display Personal | Add to Personal | OK | Cancel

# Study Review

# Review Study

## Mark a trial as Reviewed

- Track whether a trial has been reviewed
- Identifies who marked as reviewed
- Trial Settings > General tab
- 'Trial Reviewed' action is automatically logged in Notes tab of Site Description
- Checkbox is cleared when any change is made to data in the trial



Site Description		
Notes	Deviations	Protocol Comments
Date	By	Notes
Nov-27-2018	Matthew Elsinger	Automatically added by ARM: Trial Reviewed

# Review Study

## Create a review group

- 'Review' study rule defines who is allowed to mark a trial as reviewed
- **Condition** field defines who to include in the group:
  - just protocol or trial owner(s)
  - everyone in my company
  - Anyone (i.e. no group)
- Example: Sponsor wants to ensure the study is reviewed internally. Contractor can still create their own separate review group to review before sending back to the sponsor by adding another 'Review' rule for their company.

Study Rules - Rule 1 of 1				
Rule	Rule ID	Editor	Field	Condition
1	Review	Trial	Trial	Everyone in my company

# Study Rules

# Study Rules

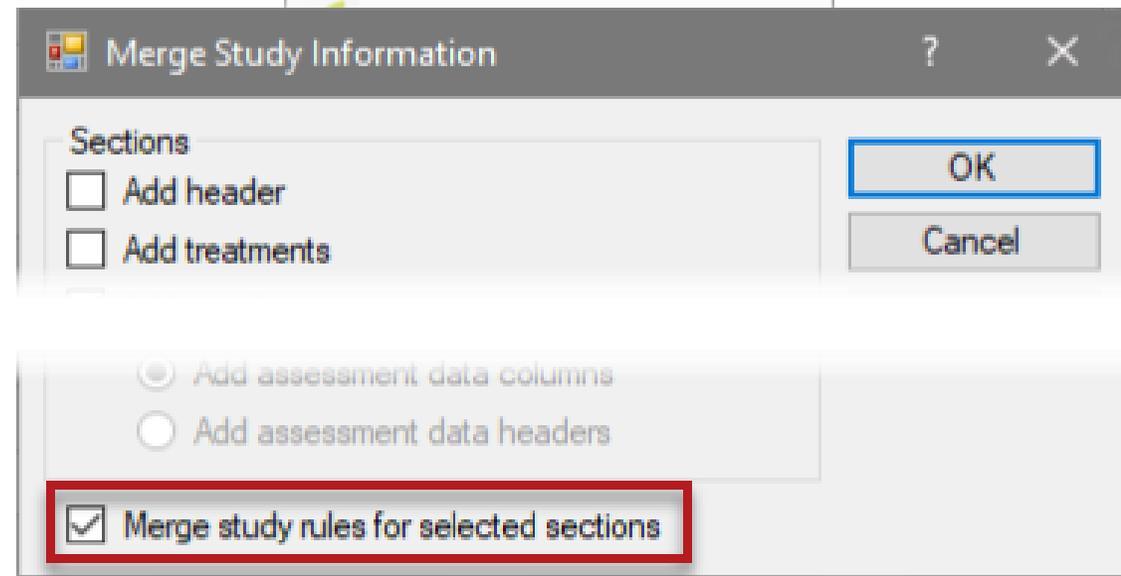
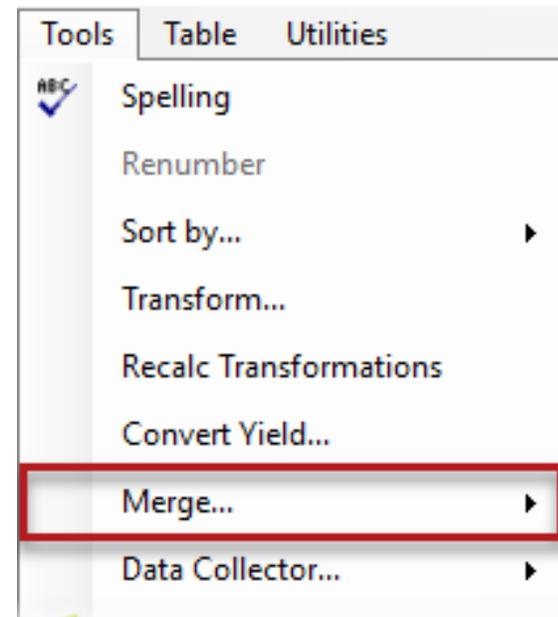
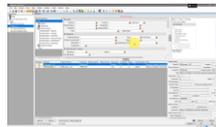
## Merge Study Information

- Easily copy information from study to study.
- Replaces “Save As” function.

## Enhancement

- Choose to *not* merge study rules if the study is originated by your company.
- Offers new flexibility for internal researchers.

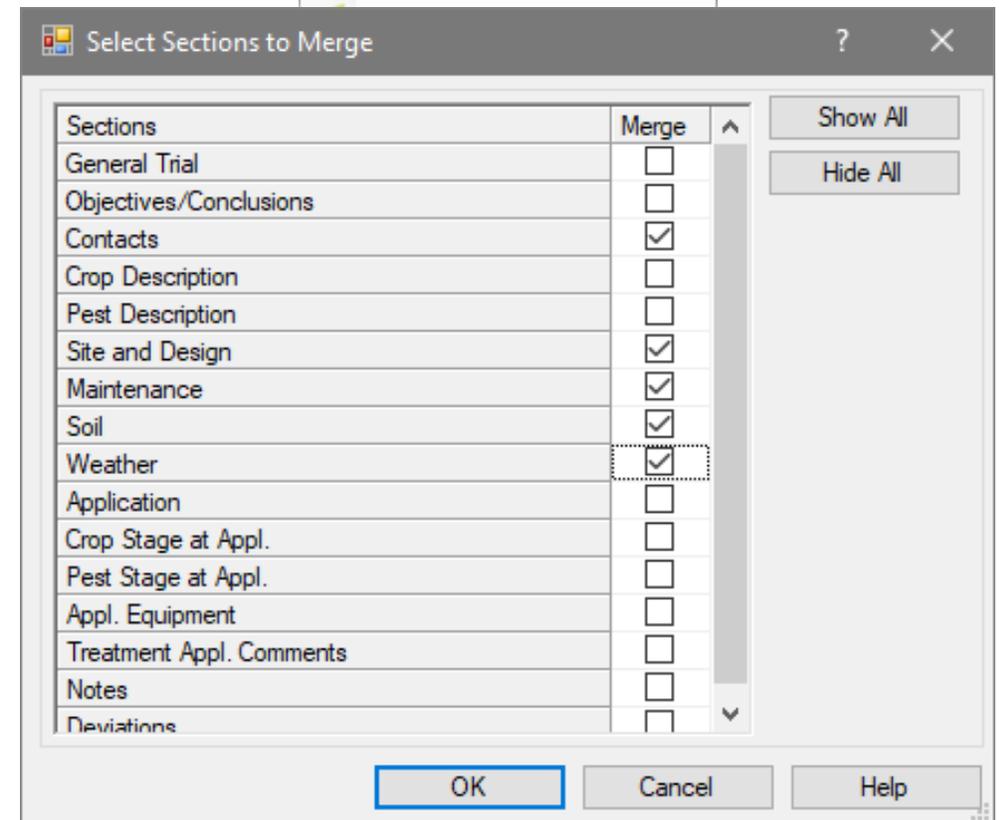
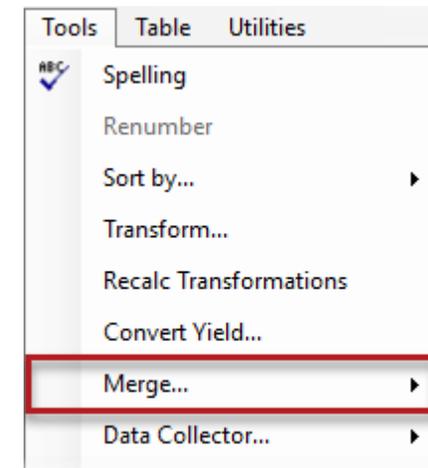
## Feature in action



# Merge Study Rules

## Enhancement

- Limit study rules merged to only selected protocol/site description sections.



# Validation

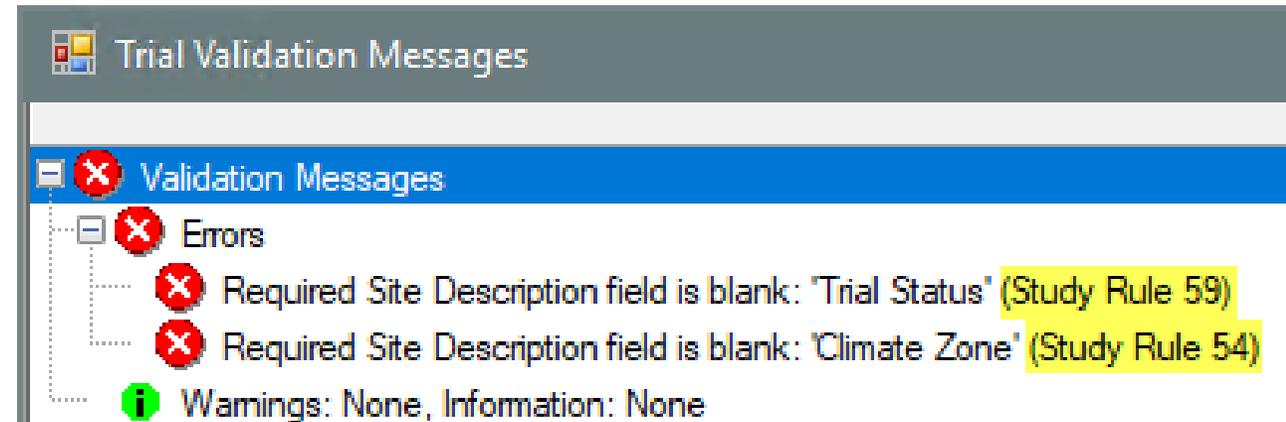
## Always Validate Studies

- Validation ensures all protocol criteria has been met.

## Enhancement

- Validation messages now list the study rule number that triggered the error or warning message.

## Feature in action



# Rule Set

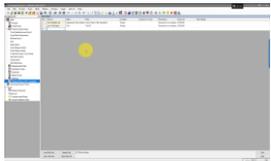
## Rule Set Name Identification

- Identifies/Verification of the correct rule set used within study.

## Enhancement

- The name of the loaded rule set now displays in the editor heading when a rule is selected within the table.

## Feature in action



Study Rules - Rule 2 of 4		Rule Set: hiddenFldsGDM		
Rule	Rule ID	Editor	Field	Condition
1	Limit validation list	Assessment Data Header	Crop & Pest in Site Description	Always
2	Hidden Field	Header	Trial Title Line # 2	If not in my company
3	Hidden Field	Treatments	Description	If not in my company
4	Hidden Field	Treatments	Comment 2	If not in my company

# Tools

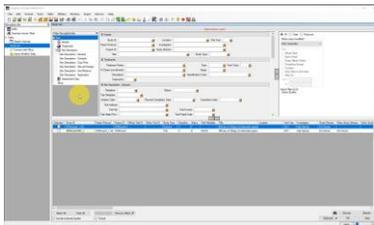
# Tools: Merge

Existing blank treatments are automatically removed when performing a merge with another study.

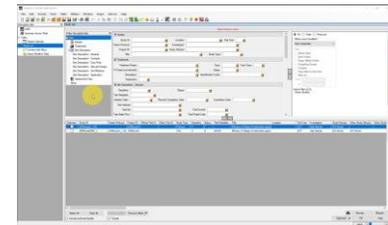
Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type
1	1					
2						
3						
4						



Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type
1	1	CHK	Untreated Check			
2	2	HERB	Banvel 720	348	GAL	L
3	3	HERB	FallowMaster	251.999985	GAL	SC
4	4	HERB	Marksman	384	GAL	F



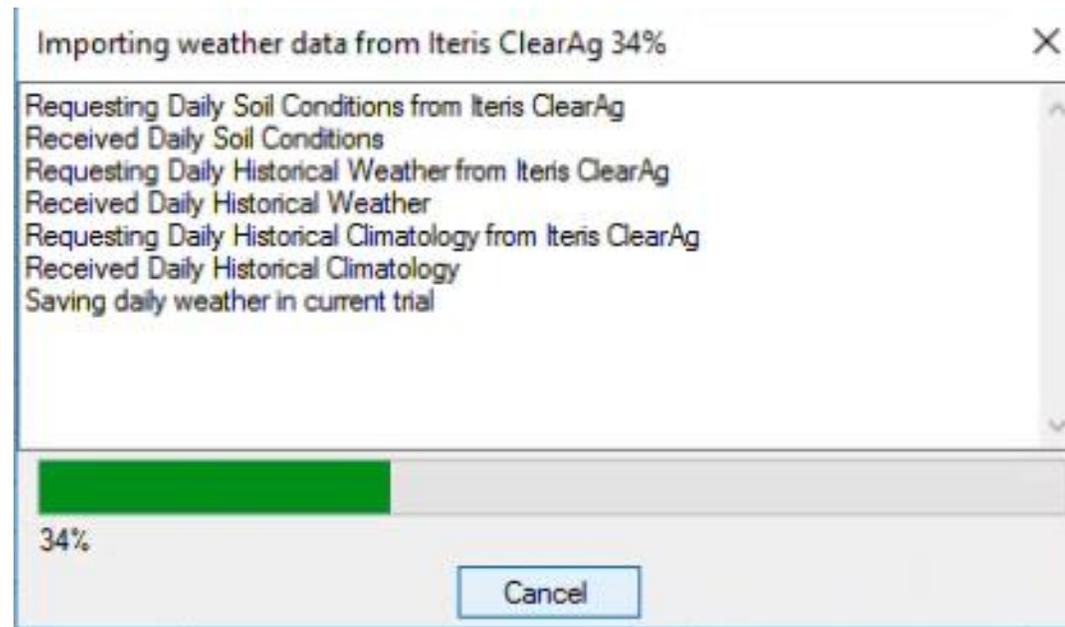
<- Before and After ->



# Tools: Import Weather

## Progress bar added during Weather import

- The weather is imported from outside the ARM software.
- This ensures you know that progress is being made 😊.

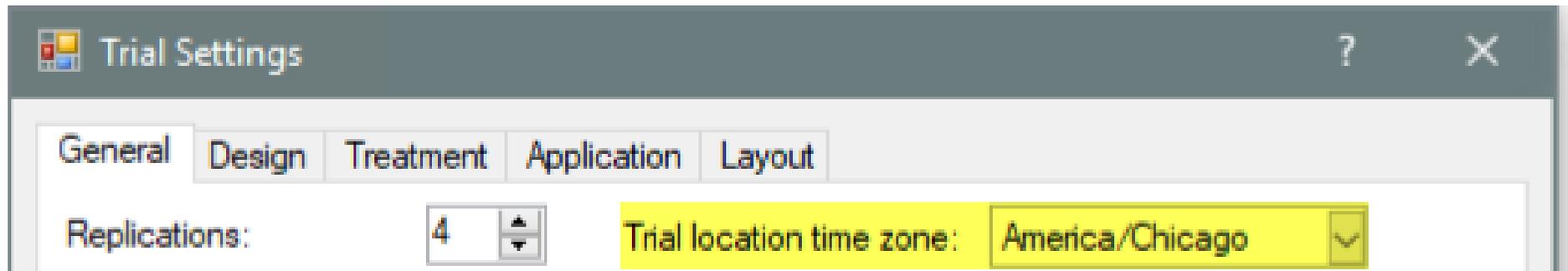


# Study Settings

# Trial Time Zone

## Why is a specific time zone needed?

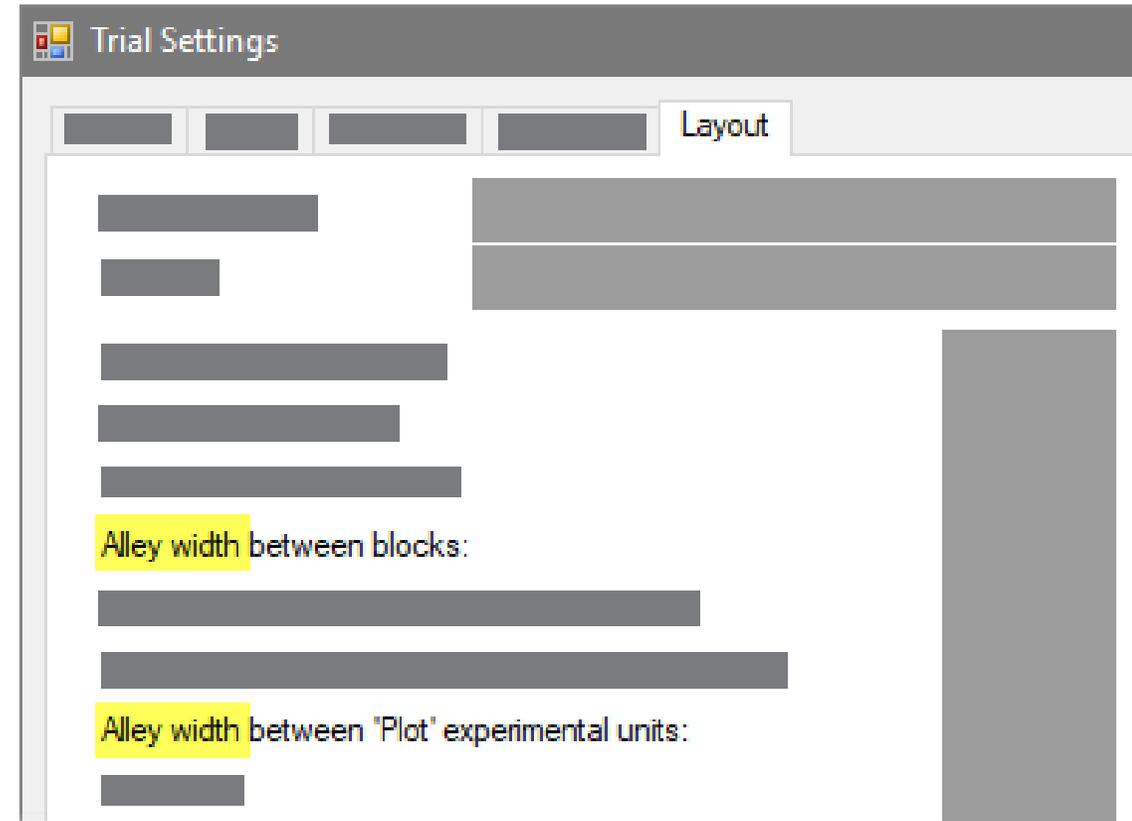
- Ensure the alignment of the trial location in relation to time zone to external data providers.
  - New Weather API will align location specific weather for a particular time, such as per application.
- Trial Settings > General tab



# Layout Options

## Clarified 'buffer' option text

- Changed to 'Alley width' - a more commonly used term
- Previously called 'Buffer' between blocks or plots
- Protocol/Trial Settings > Layout tab

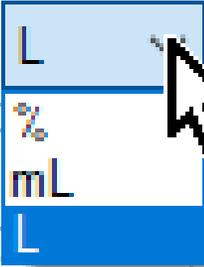


# New Options - Liters

## Liters as an Overage Option

- Clients may have equipment that requires a very large amount of overage. Instead of using ML's (1000's), you now have the option of Liters. Example: 2150ML vs, 2.15L.
- Can be entered in the Settings > Application tab or, Appl. Equipment > Mix Overage, Unit or, Application Plan.

Mix size

Treatments	1
Replications	4
'Plot' EU size	25 m2
Application volume	20 L/ha
Mix size unit	mL 
Minimum	200 mL
Overage:	<input type="text" value="2.15"/> 
<input checked="" type="radio"/> Calculated mix size	2350 mL
<input type="radio"/> User-defined mix size	<input type="text" value="2.15"/>

# Mix Size Units

## Enhancement

- Brings consistency to the unit names whether you are in the treatments editor, settings, or application plan.
- Settings > Application tab
- Appl. Equipment > Mix Overage, Unit or, Application Plan

The screenshot shows the 'Trial Settings' dialog box with the 'Application' tab selected. The 'Application volume' is set to 200 L/ha. The 'Mix size unit' is set to 'L'. The 'Minimum' is 2 L, and the 'Overage' is 150 mL. A note indicates '2 L based on 1 trts; 4 reps; 25 m2 'Plot' experimental unit size; 200 L/ha volume'. Below this is a 'Mix Size Unit Master List (MIX\_SIZE\_UNITS)' table.

Mix Size Unit	Description 1	Description 2
FT3	cubic feet of mix	quantity of soil or media to treat
g	grams of mix	for preparing a granule or dry carrier
g seed	grams of seed	quantity of seed to treat
GAL	gallons of mix	for liquid sprays using a diluent
kg seed	kilograms of seed	quantity of seed to treat
L	liters of mix	for liquid sprays using a diluent
LB seed	pounds of seed	quantity of seed to treat
m3	cubic meters of mix	quantity of soil or media to treat
mL	milliliters of mix	for liquid sprays using a diluent
seeds	seeds (for /seed rate units)	for seed treatment studies when rates are /seed or /unit
units	units of seeds (for /unit rate units)	when treatment rates are /unit, /plant, /n plants, /item, or /seed
YD3	cubic yards of mix	quantity of soil or media to treat

# Site Description

# Track Trial Progress

## Why document trial progress?

- Requested by sponsors.
- Provides visibility and credibility to timely data entry.
- Added new fields to track status and progress throughout the season.

### General Trial Information

Discipline:  *herbicide*  
Trial Status:  *established*  
Trial Usage/Type:  *Screening/Exploratory*  
Initiation Date:

Data Location:   
Trial Reliability:   
**ARM Trial Created On: Sep-19-2018**  
Planned Completion Date:

### Pest Description

Insert Pest with Shift+F7, Delete current Pest with Shift+F8

-	Pest 1 Type: <input type="text" value="W"/>	Code: <input type="text" value="GGGAN"/> <input type="text" value="Annual grasses"/>
	Common Name: <input type="text" value="Annual grasses"/>	<b>Entry Date: Jul-20-2018</b>
	Attributes: <input type="text"/>	

# Track Trial Progress

Additional new fields to track status and progress throughout the season.

- Application tab > **Appl. Entry Date**
- Assessment Header > **Data Entry Date**

Assessment Data - Line 4	
Column Number	1
Part Rated	LEAF <input type="checkbox"/> C <input type="checkbox"/>
Rating Type	PHYGEN
Rating Unit	%
Number of Subsamples	1
<b>Data Entry Date</b>	<b>Sep-19-2018</b>
Trt-Eval Interval	7 DA-C

## Application Description

	D		
Application Date:	Sep-19-2018		
Appl. Start Time:	11:15 AM		
Application Method:	SPRAY		
Application Timing:	POSPOS		
Application Placement:	BROFOL		
Applied By:			
<b>Appl. Entry Date:</b>	<b>Sep-19-2018</b>		
Air Temperature Start, Stop:	19.5		C

# Protocol Instructions

## Support Rich-Text Formatting

- Preserves the format from the original protocol through to the Trial.

Site Description

Crop Stage at Appl. Pest Stage at Appl. Appl. Equipment Treatment Appl. Comments Notes Deviations Protocol Comments

Site Information

*Provide weather data as follows (min. requirement):  
as from 1 day before application up to the final assessment average, main and max temperature and precipitation on a daily basis. => Data from the nearest weather recording station should be attached as a file in standard format (for example Excel table, Comma or tab separated lists ...) Indicate the distance of the trial site to the weather station*

*Comment on any extreme weather situation in trial comments.  
Mention every irrigation application including all details in the DAT file*

*For assessments follow the Data header information in detail*

Data to Collect

*Do an assessment on general Phytotox at every visit to the trial site. In case any phyto is visible, assess on each of these effects separately (for example smaller leaves and chlorosis). Assessments should be done on frequency and intensity of the symptom. Create an adequate header for these specific assessment. In case of insecurity of the codes to use, make sure to fully verbally describe the type of assessment in the footnote!*

*Assess all effects on any other than the pre-defined target weeds as well as on beneficial insects!*

*Report all other treatments in detail in the "crop maintenance" chapter of the DAT file.*

[Normal] Arial 10 B I U

Provide weather data as follows (min. requirement):

- as from 1 day before application up to the final assessment average, main and max temperature and precipitation on a daily basis. => Data from the nearest weather recording station should be attached as a file in standard format (for example Excel table, Comma or tab separated lists ...) Indicate the distance of the trial site to the weather station
- Comment on any extreme weather situation in trial comments.
- Mention every irrigation application including all details in the DAT file

For assessments follow the Data header information in detail

- Do an assessment on general Phytotox at every visit to the trial site. In case any phyto is visible, assess on each of these effects separately (for example smaller leaves and chlorosis). Assessments should be done on frequency and intensity of the symptom. Create an adequate header for these specific assessment. In case of insecurity of the codes to use, make sure to fully verbally describe the type of assessment in the footnote!
- Assess all effects on any other than the pre-defined target weeds as well as on beneficial insects!

Report all other treatments in detail in the "crop maintenance" chapter of the DAT file.

# Application tab

New fields to document additional weather details at time of application:

- 'at stop time' variants of:
  - Air Temperature
  - % Relative Humidity
  - Wind Velocity + Direction
- Soil Surface Condition
- Moisture 6 Hours after Appl
- Comment

## Application Description

	A	B
Application Date:	15-Apr-2018	3-Jun-2018
Appl. Start Time:	2:30 PM	10:00 AM

Applied by:		
Appl. Entry Date:		
Air Temperature Start, Stop:	17 [ ] C	17 [ ] C
% Relative Humidity Start, Stop:	[ ]	[ ]
Wind Velocity+Dir., Start:		
Wind Velocity+Dir., Stop:		
Wind Velocity+Dir., Max:		
Wet Leaves (Y/N):		
Soil Temperature, Unit:	10 C	13 C
Soil Moisture:	MOIST	DRY
Soil Surface Condition:		
% Cloud Cover:	50	20
Next Moisture Occurred On:		
Time to Next Moisture, Unit:		
Moisture 6 Hours after Appl.:		
Moisture 1 Week after Appl.:		
Weather Source:		

Comment:

# Previous Crops

## Site and Design > Previous Crops table

Additional new fields to document previous conditions at the trial site.

- Previous Pest
- Month (that crop/pest was present)
- Comment

General Trial | Objectives/Conclusions | Contacts | Crop Description | Pest Description | Site and Design | Maintenance

**Site and Design**  
Some information is copied from General and Design tab of Settings - make changes there

Insert row with Shift+F7, Delete current row with Shift+F8

No.	Previous Crop	Previous Pest Type	Previous Pest	Previous Pesticides	Year	Month	Comment
1.	ZEAMD	D	ERYSGT		2018		

# Collapsible Repeating Sections

## Fixed:

- Repeating section panels now resize after displaying hidden fields.

The screenshot displays a software interface titled "Site Description" with a navigation bar containing tabs: General Trial, Objectives/Conclusions, Contacts, Crop Description, Pest Description, Site and Design, Maintenance, Soil, Weather, Application, Crop Stage at Appl., and Pest Stage at. The "Crop Description" tab is active, showing a sub-header "Crop Description" and a tip: "Insert Crop with Shift+F7, Delete current Crop with Shift+F8".

The interface features two repeating sections for crop descriptions. The first section is expanded, showing the following fields:

- Crop 1: TRZAW (dropdown), Triticum aestivum (winter) (dropdown), Winter wheat (dropdown)
- Variety: Local (dropdown), BBCH Scale: BCER, Crop Group: (dropdown)
- Description: (dropdown), Maturity Group: (dropdown)
- Seed Size, Unit: (input), (dropdown)
- Seed Shape: (dropdown), Nursery Date: (dropdown)
- Plant Shape: (dropdown), Planting Date: Oct-15-2013 (dropdown)
- Spacing within Row, Unit: (input), (dropdown), Planting Method: DRILLE (dropdown) drilled
- Rows per Plot: (input), Harvested Width, Unit: 1.1 (input) M (dropdown)
- Planting Density, Unit: (input), (dropdown), Harvested Length, Unit: 9 (input) M (dropdown)
- Soil Temperature, Unit: (input), (dropdown), Harvest Equipment: COMBINE (dropdown)
- Perennial Age, Unit: (input), (dropdown), % Standard Moisture: 15.0 (input)
- Plant Arrangement: (dropdown)

A red rectangular box highlights the bottom portion of the first section, indicating its height. The second section is partially visible below, showing fields for Crop 2, Variety, Description, Seed Size, Unit, Maturity Group, and Nursery Date.

# Trial Origin

## Why track the trial origin?

- Helps answer budget questions.
- Valuable to the R&D division.
- ID's in-house, contracted or by a public institution trials.

Header

Title:

Study Rules

Trial ID:  Location:

Protocol ID:  Investigator: *Matthew Elsinger*

Study Director:

Sponsor Contact:

Conducted Under GEP:

Trial Origin:  *contracted trial*

### Trial Location

Insert row with Shift+F7, Delete current row with Shift+F8

Trial ID	Responsible	Site	Trial Origin	Number of Trials	Site Requirements
123 a 1-5	R.E. Cearch		C	5	
123 a 6-7	Debra Dooley's Data		I	2	
123 a 8-10	Fred's Quality Data		C	3	

Header editor > Trial Origin or,  
Trial Establishment Guidelines > Trial location Table

# Application Equipment and Plan

## Auto-Fill default settings for application planning fields.

- Intuitive way of using Settings set to default and fill out the plan.

Application Information	
Application Date	<i>Apr-15</i>
Row Sides Applied	
Spray Volume, Unit	250 L/HA
<i>Minimum Mix/Treatment</i>	<i>2.5 liters</i>

## Enhancement

- Auto-fills with default entries when clicking in a blank field for mix size, mix overage and spray volumes.

# Assessment Data

# View Options

Show more than one type of entry when matching on a field.

## How does it work?

Select multiple items for the “Match” column Filter.

Column filter

Prompt	Match	Sort	Visible
Rating Time	(All)		<input checked="" type="checkbox"/>
Rating Type	(All)		<input checked="" type="checkbox"/>
Rating Unit			<input checked="" type="checkbox"/>
Sample Size, Unit			<input checked="" type="checkbox"/>
Collection Basis, Un			<input checked="" type="checkbox"/>
Reporting Basis, Un			<input checked="" type="checkbox"/>

⋮ A↓ Z↑ | OK

- (All)
- AREA
- MOICON
- PESSEV
- PHYGEN
- VIGOR
- YIELD

Display sort as tabs

Clear Show All Hide All

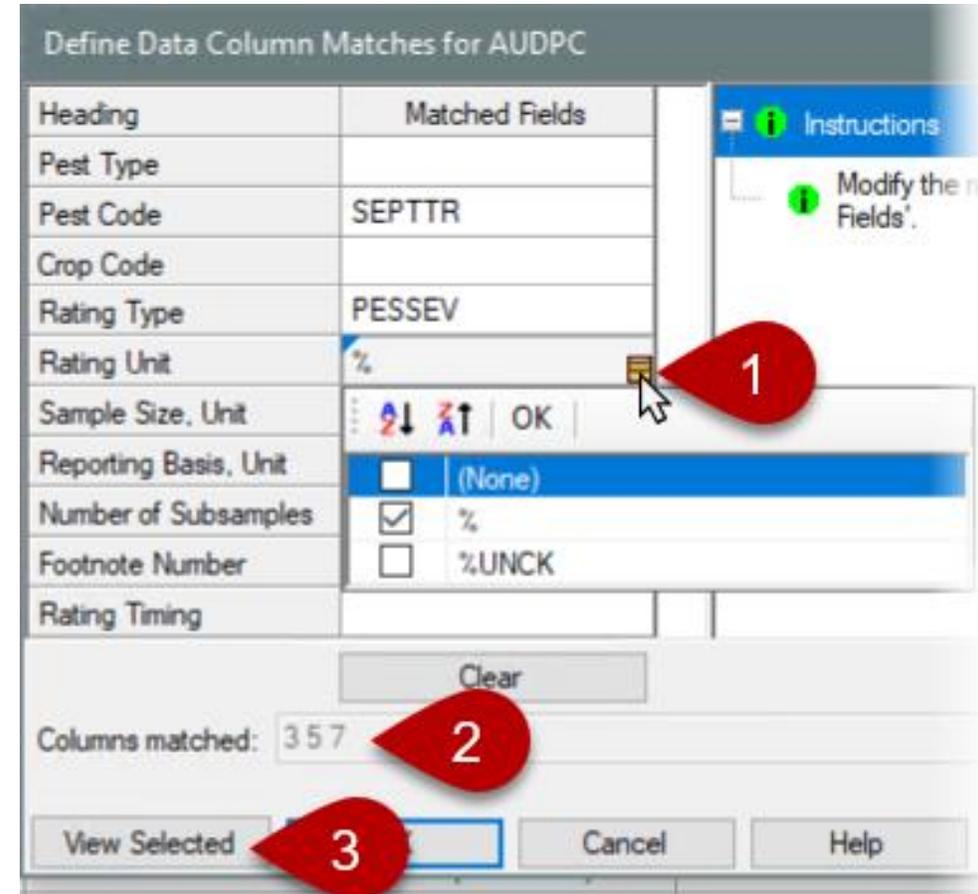
# AUDPC Transformation

## Enhancement during AUDPC

- Allows selecting multiple values for match fields.
- Lists columns currently matched.
- View only selected/matched columns on the assessment data editor.

## Where is this feature?

- Tools > Transform, select AUDPC



# Plot Pictures

## Include Column ID in assessment image file name

- Helpful when attaching images for multiple assessments taken on the same day

## Where is this feature?

- Assessment data editor > Properties Panel > Attach

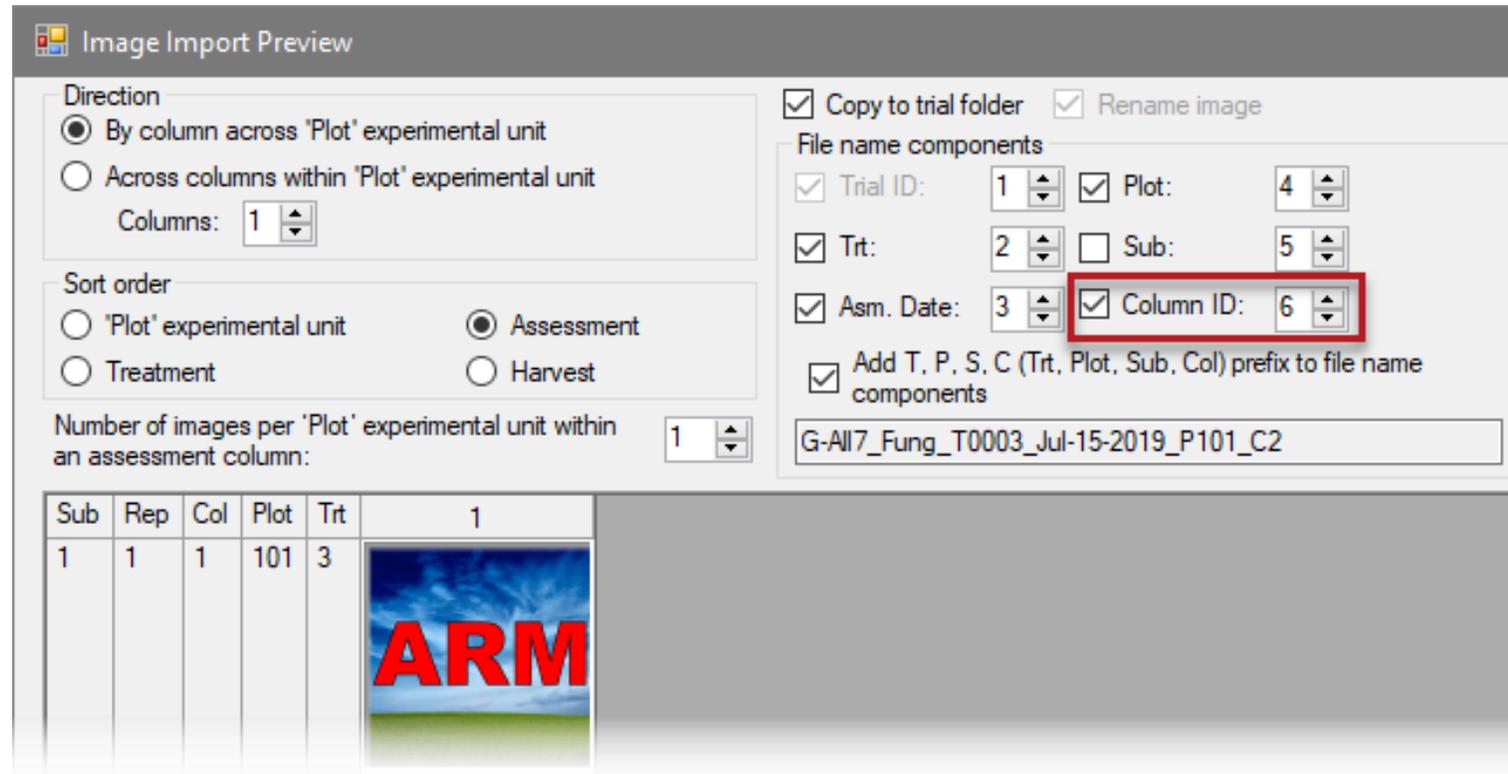


Image Import Preview

Direction

- By column across 'Plot' experimental unit
- Across columns within 'Plot' experimental unit

Columns: 1

Sort order

- 'Plot' experimental unit
- Assessment
- Treatment
- Harvest

Number of images per 'Plot' experimental unit within an assessment column: 1

Copy to trial folder  Rename image

File name components

- Trial ID: 1
- Plot: 4
- Trt: 2
- Sub: 5
- Asm. Date: 3
- Column ID: 6

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

G-All7\_Fung\_T0003\_Jul-15-2019\_P101\_C2

Sub	Rep	Col	Plot	Trt	1
1	1	1	101	3	

# Tablet Data Collector (TDCx)

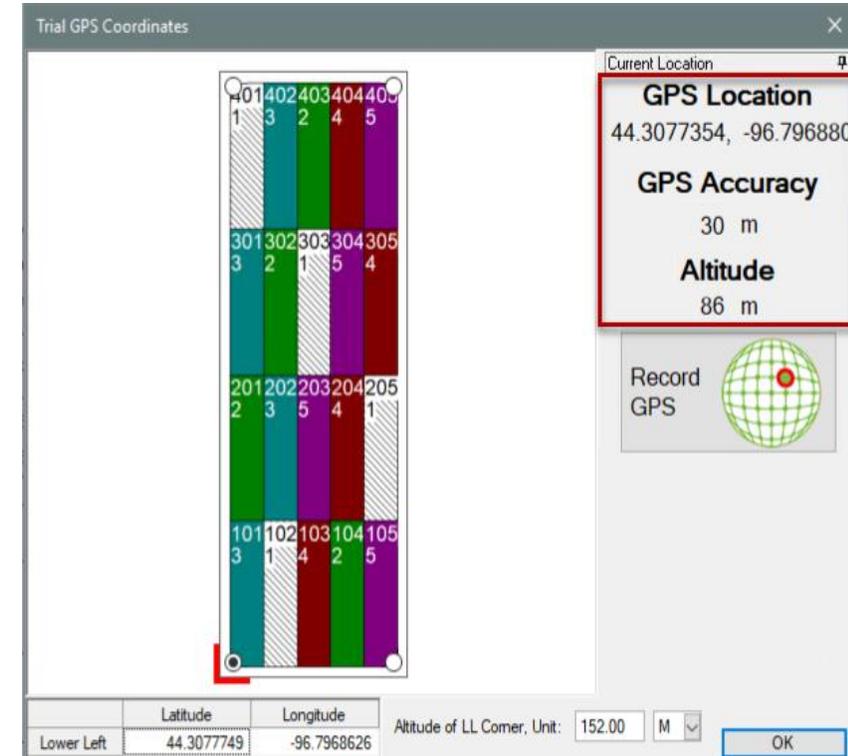
# Record GPS

## Display the current position in real-time

- Researchers now can determine the accuracy of the GPS device while documenting coordinates.
- TDCx will display: GPS coordinates, accuracy and altitude.

## Where is this feature?

Choose “Tablet Read GPS Editor”



# Properties Panel

## Increased size of Pin button

- Previously was hard to click on the small Pin button to unlock a Properties panel when using a stylus (or finger) on a tablet



# ARM Migration

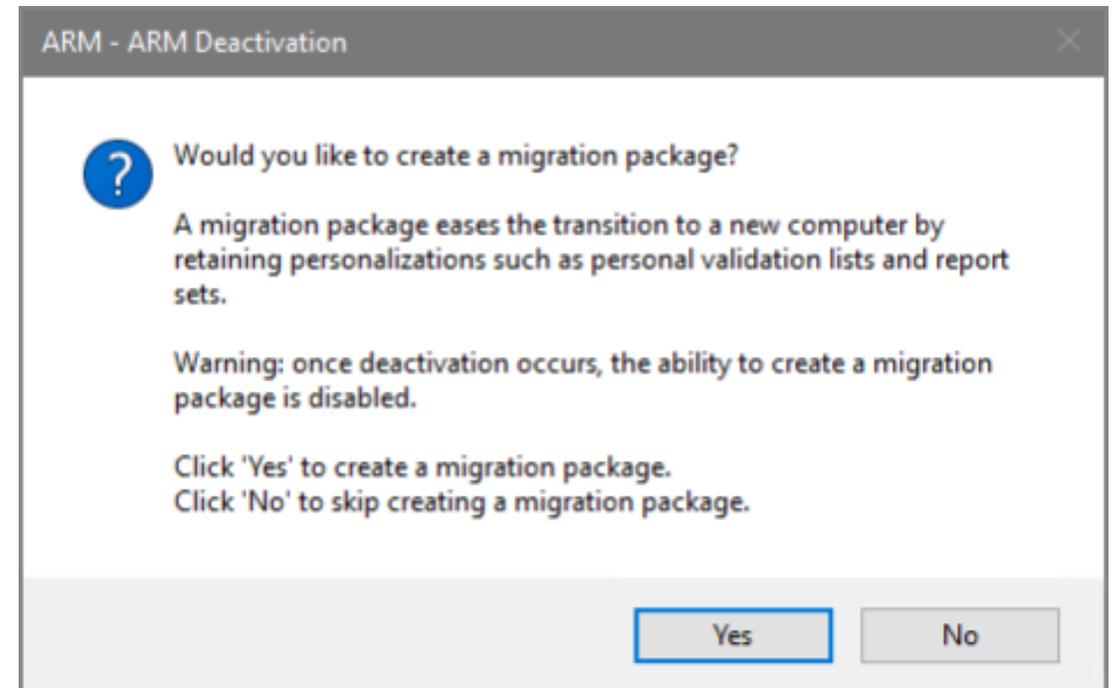
# Migrate Settings

## Copy settings when moving to a new PC

- Copy personal lists, report sets, ARM settings to new computer

### What's new?

Prompt to create package *before* deactivating the old PC.



# Reports

# Spray Seeding Plan

## Why minimum mix size calculator?

- This helps determine the minimum mix needed.
- Proactively plan for your trial with this calculation.

Reps: 4      Appl Code: A      Plots: 2.5 by 10 meters  
Spray vol: 250 L/ha      Mix Size: 2.65 L (total for 4 plots; minimum=2.5 L, overage=150 mL)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Form Rate	Form Unit	Rate Appl Code	Spray Volume	Volume Unit	Mix Size	Mix Unit	Amt Product to Measure	Rep 1	Rep 2	Rep 3	Rep 4
3	Tub	250	G/L	EC	1	l/ha	ABC	250	L/HA	2.65	L	10.6 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	250	L/HA	2.65	L	5.3 mL/mx	103	204	305	404
2	Tub	250	G/L	EC	0.5	l/ha	ABC	250	L/HA	2.65	L	5.3 mL/mx	104	201	302	403
5	Mico 60	600	G/L	EC	1.5	l/ha	AB	250	L/HA	2.65	L	15.9 mL/mx	105	203	304	405

## Enhancement

- ARM reports the bare minimum mix size needed to cover the area of all 4 reps.