



Our Mission

“Provide the research community technology to improve efficiency and accelerate innovation”

**ARM Software is Trusted by Over 10,000
Researchers and Scientists Worldwide**





Use ARM for all stages of an experiment.

To **plan and create** protocols, to **randomize and manage** trials, to **analyze data and report** the results.



ARM software provides a defined structure to enter information consistently, with master list dictionaries to standardize vocabulary, and has tools for every step of an experiment.





The Last Year in Review





ARM the Industry Standard

The top 12 Agro-Chemical companies now depend on ARM Software worldwide.

Field License Bundle

This bundle brings ARM to the field to help improve efficiency and accuracy.



Leaf Wall Area

Software solution for an industry specific challenge. ARM facilitates the research techniques for future regulation of product applications.





Weather Data Import

Collaboration with ClearAg (Iteris) to build a new feature that allows you to import weather data.

ClearAg offers specific information by utilizing meteorology, agronomy, land surface modeling and crop production at specific GPS coordinates.



Marketing & Support

We hired a full-time sales and marketing associate to focus on our client communications.

The Year Ahead



CUSTOMER
FRIENDLY
SUPPORT
INNOVATIVE
POSITIVE
PRECISE
TIMELY



Training Initiatives

Continue to expand our tools and resources to make it easier for our clients.

- Tutorials
- Coaching Events
- Webinars

Product Release

Work as a team to ensure every client is aware of the new features and how to use them to make their work more efficient.





Client Driven Development

Working closely with our clients to implement additional features and intuitive reporting.

Providing new features throughout the year.



ARM improves efficiency, increases accuracy, and promotes better quality of results.



ARM 2019 Enhancements

Study Rules

Study Rules

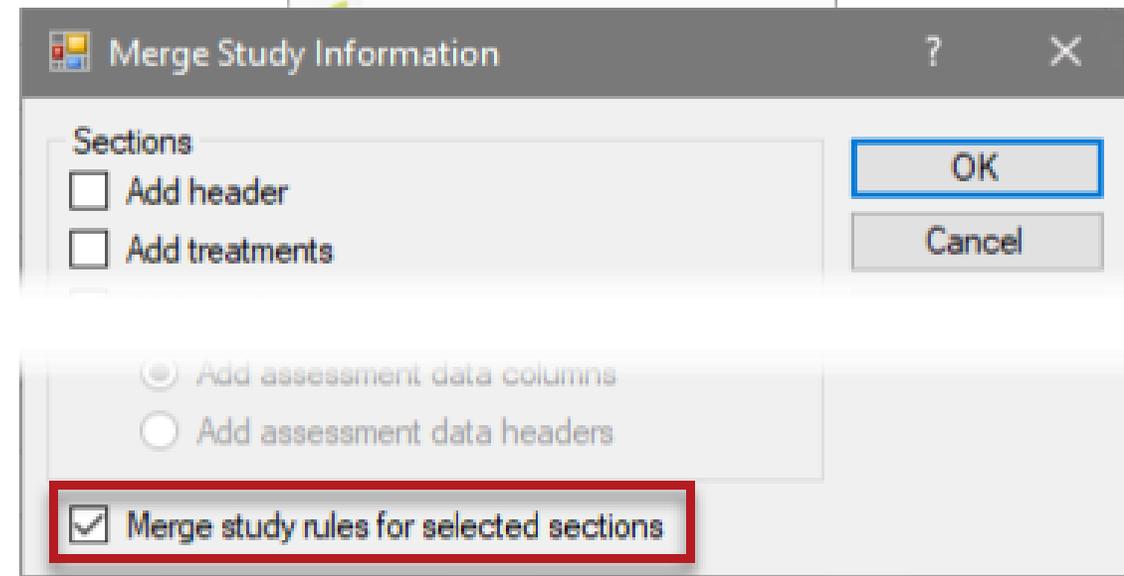
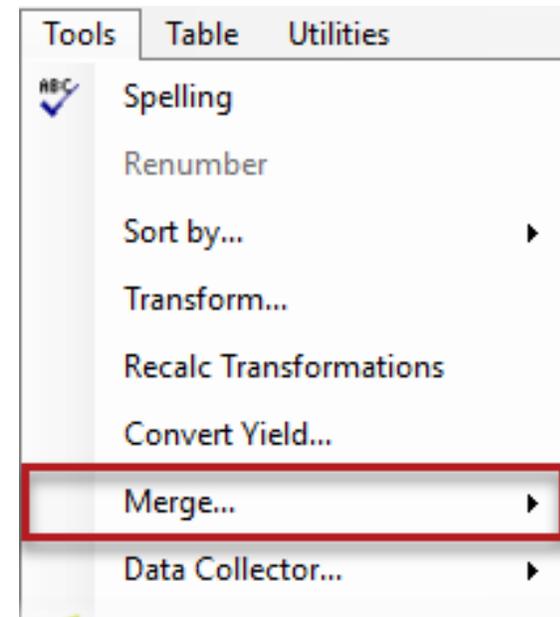
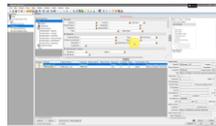
Merge Study Information

- 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.

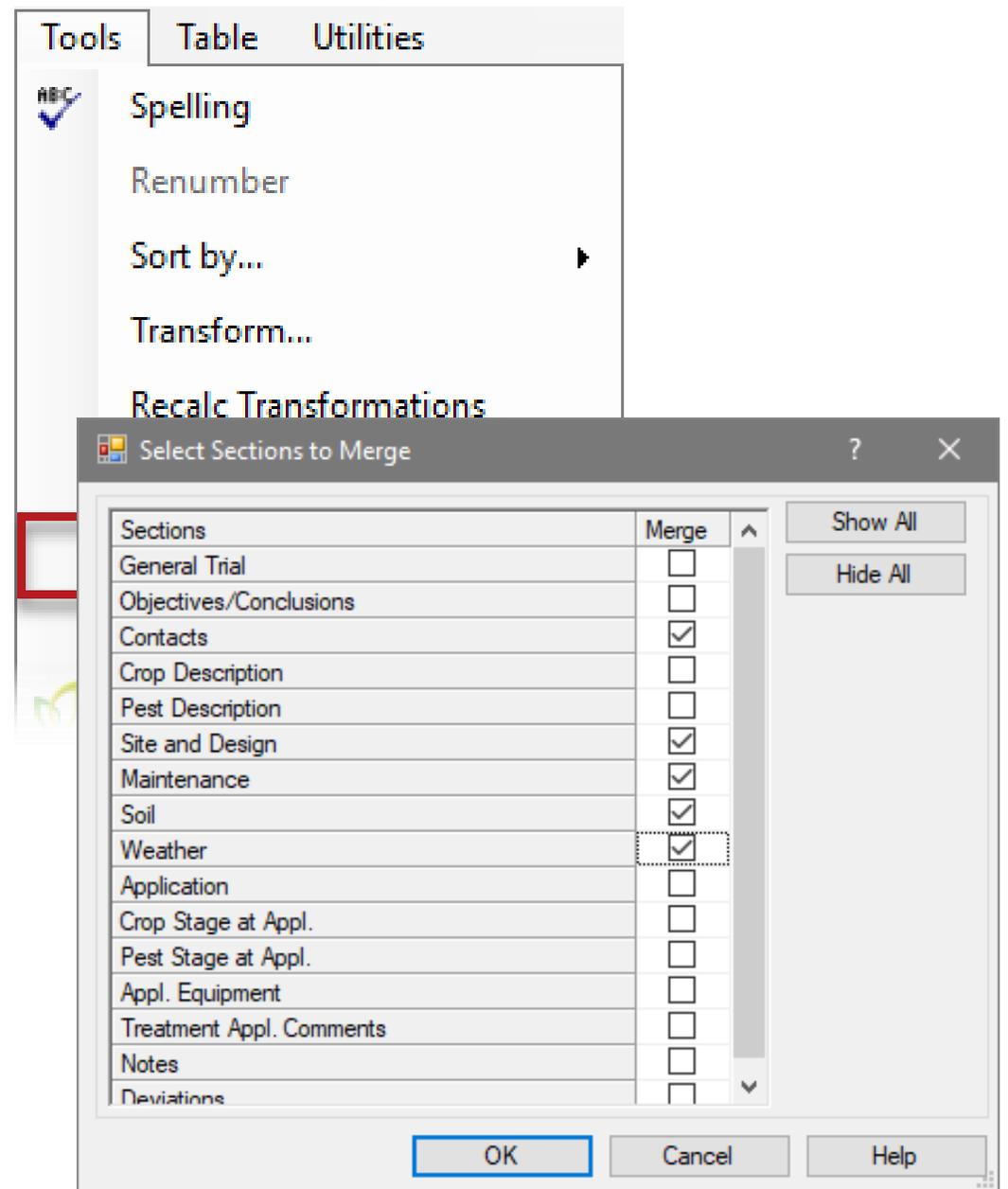
Feature in action



Merge Study Rules

Enhancement

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



Validation

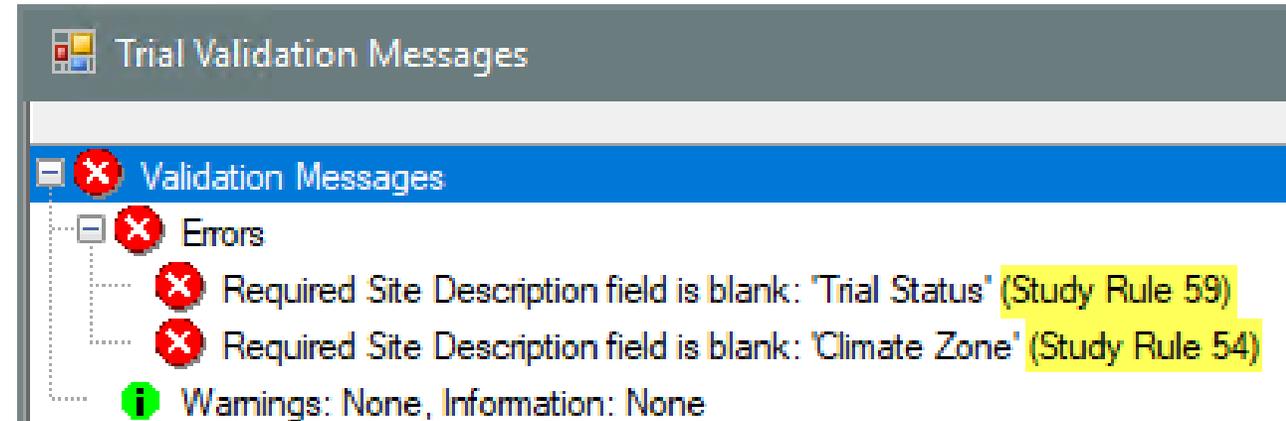
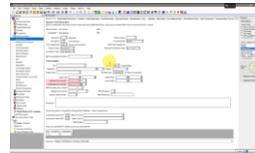
Always Validate Studies

- 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

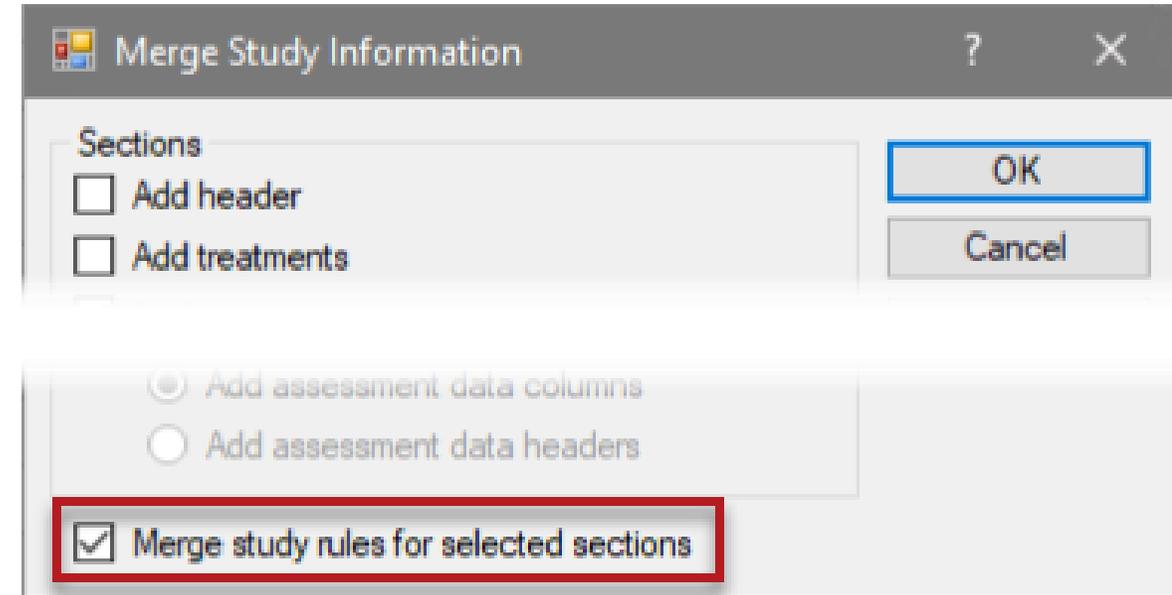
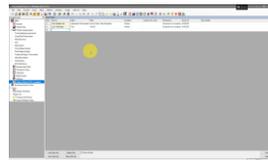
Rule Set Name Identification

- 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

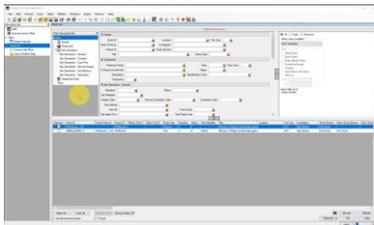
Tools: Merge

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

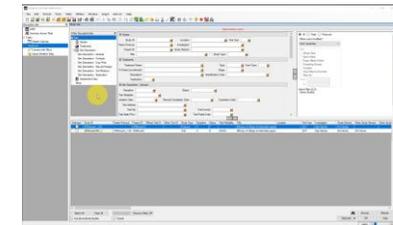
Treatments - Line 1						
Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type
1	1					
2						
3						
4						



Treatments - Line 1						
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



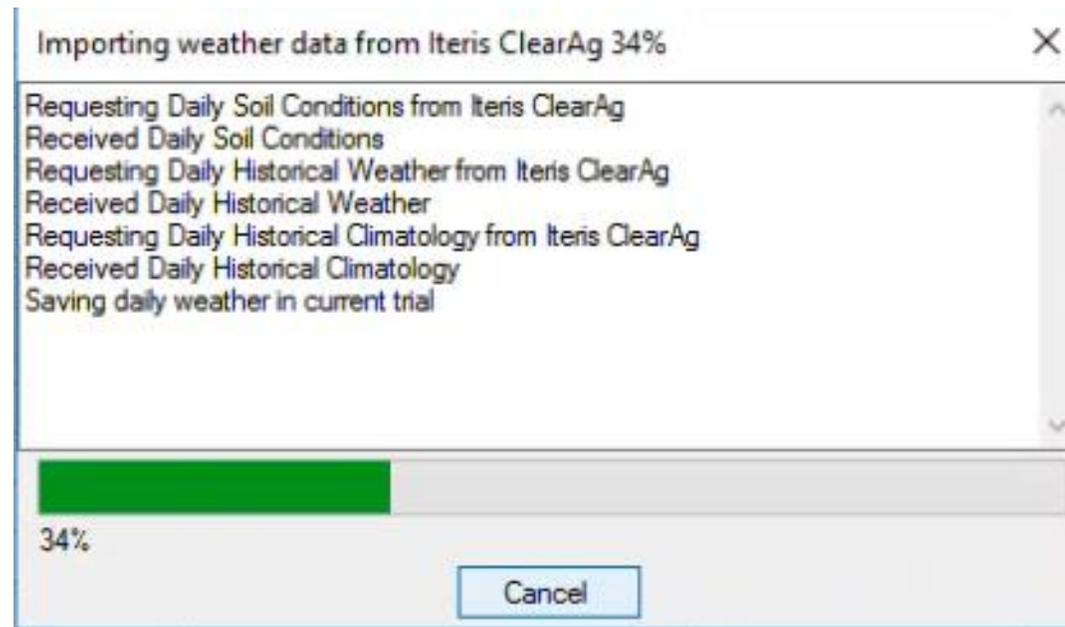
<- Before and After ->



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 😊.



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

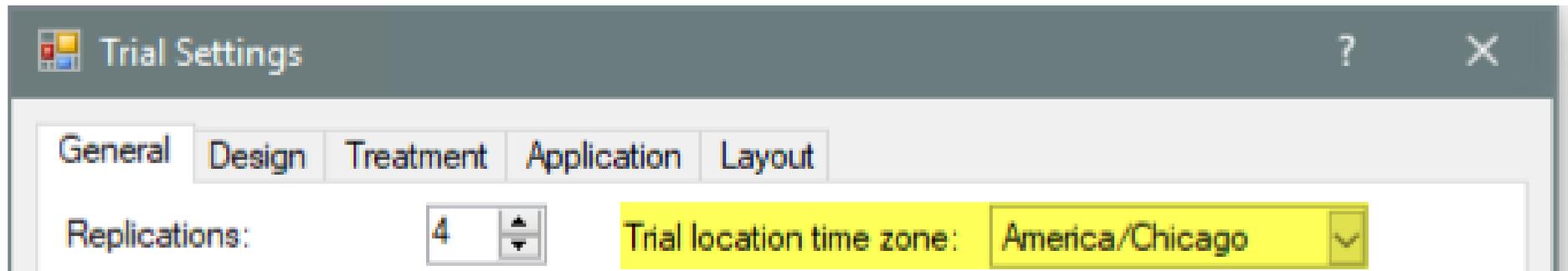
- ARM reports the bare minimum mix size needed to cover the area of all 4 reps.

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

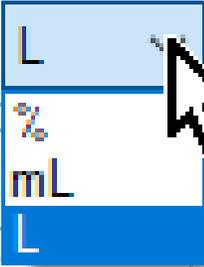


New Options - Liters

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

Trial Settings

General Design Treatment Application Layout

Application volume: 200 L/ha Application Plan...

Treatments 1

Application volume 200 L/ha

Mix size unit L

Minimum 2 L 2 L based on 1 trts; 4 reps; 25 m2 'Plot' experimental unit size; 200 L/ha volume

Overage: 150 mL

Calculated mix size 2.15 L

Mix Size Unit Master List (MIX_SIZE_UNITS)

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

(All) (All) (All)

Active Filter Remove Filter Display Personal Add to Personal OK

Site Descriptions

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"/>	Entry Date: Jul-20-2018
	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
Data Entry Date	Sep-19-2018
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:		
Appl. Entry Date:	Sep-19-2018	
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):

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- 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

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- 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.

Collapsible Repeating Sections

Fixed:

- Repeating section panels now resize after displaying hidden fields.

The screenshot displays a software interface titled "Site Description" with a tabbed menu. The "Crop Description" tab is active, showing a form for entering crop details. The form is divided into two repeating sections. The first section, "Crop 1", is expanded and contains the following fields: Crop 1 (TRZAW), Variety (Local), Description, Seed Size, Unit, Seed Shape, Plant Shape, Spacing within Row, Unit, Rows per Plot, Planting Density, Unit, Soil Temperature, Unit, Perennial Age, Unit, BBCH Scale (BCER), Maturity Group, Nursery Date, Planting Date (Oct-15-2013), Planting Method (DRILLE), Harvested Width, Unit (1.1 M), Harvested Length, Unit (9 M), Harvest Equipment (COMBINE), % Standard Moisture (15.0), and Plant Arrangement. The second section, "Crop 2", is collapsed. A red rectangular box highlights the collapse bar between the two sections.

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"/>

⌵ ⌴ ⌶ | OK

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

Display sort as tabs

Clear Show All Hide All

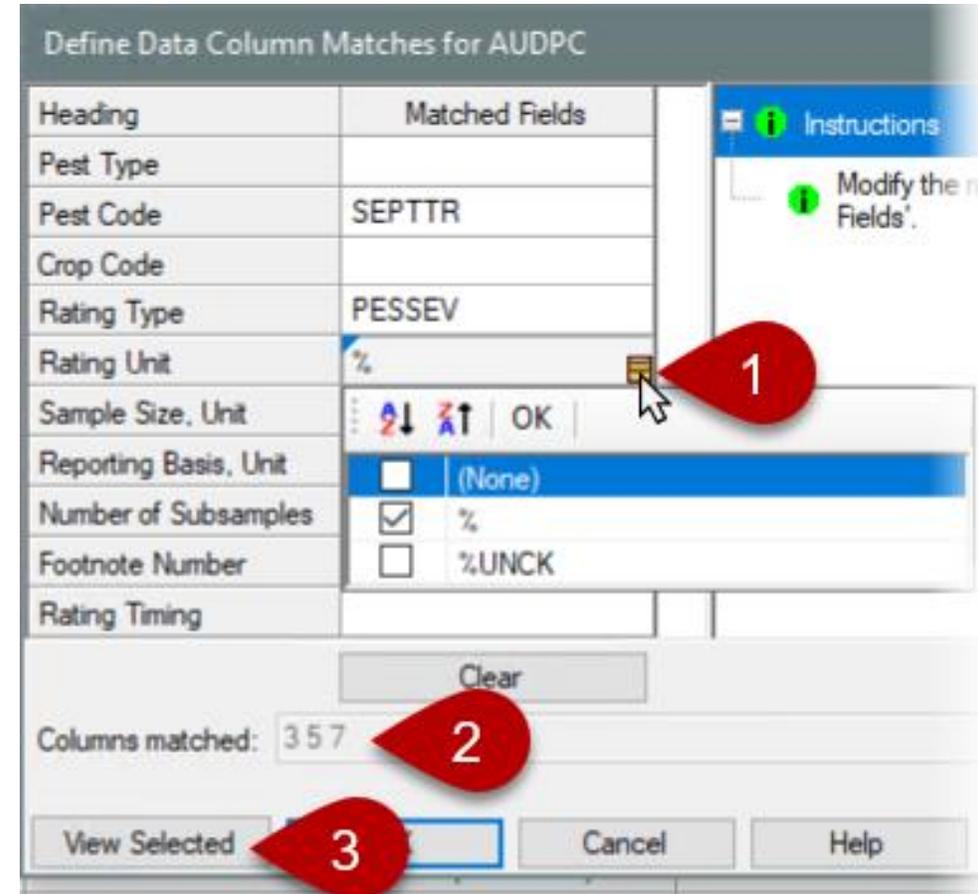
AUDPC Transformation

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



Tablet Data Collector (TDCx)

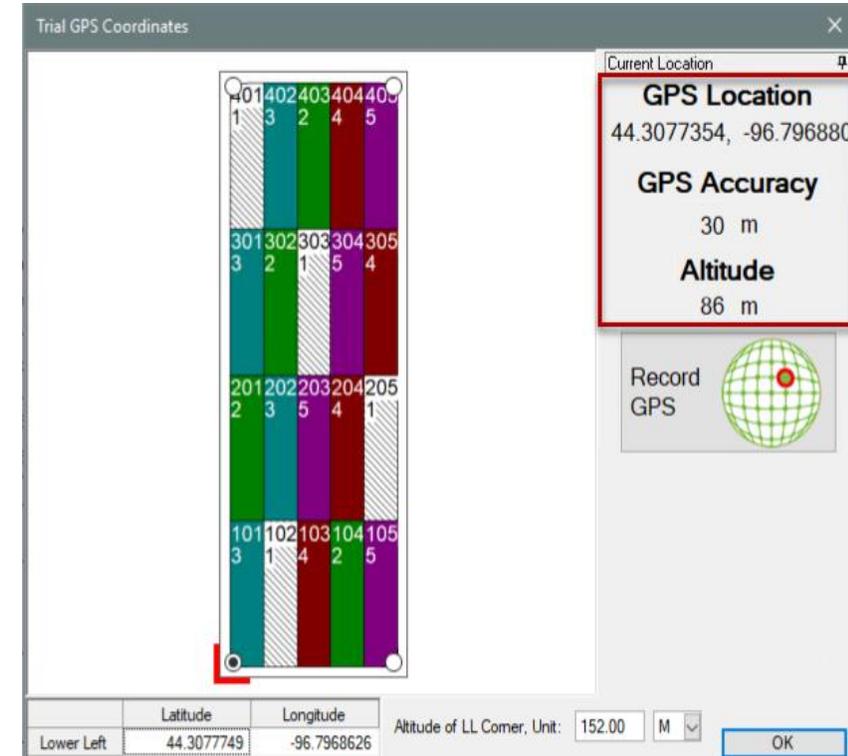
Record GPS

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”



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 Header, Tasks' to create the SEs and tasks defined in this tab

Multiple rating timings create columns 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

1.

Rating Timing

SE Name

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) (All)

Active Filter

Remove Filter Display Personal Add to Personal OK Cancel

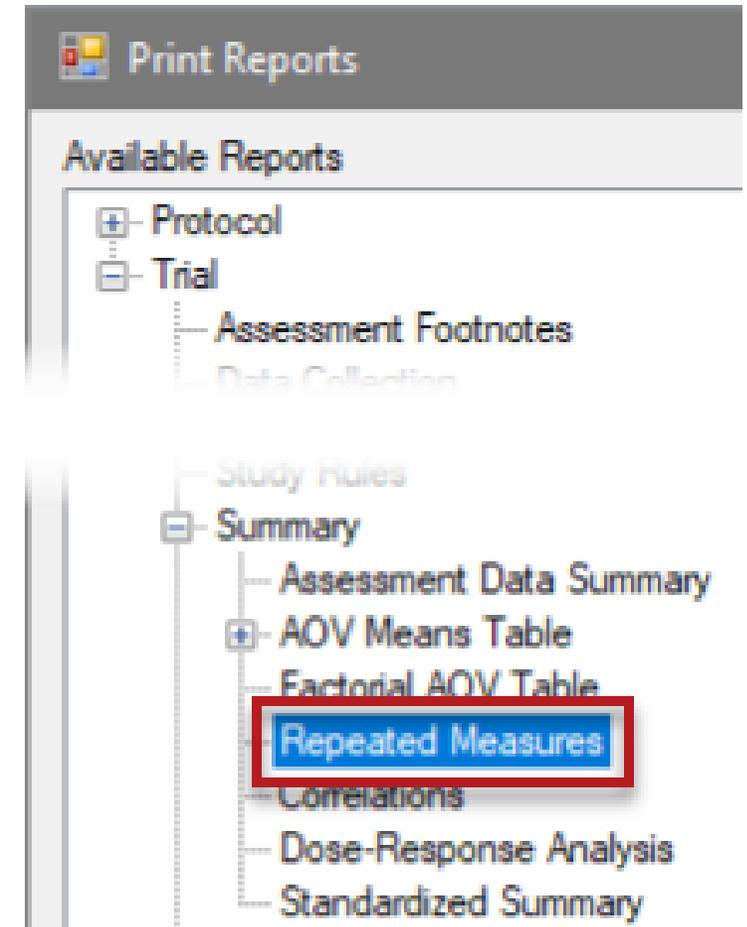
Repeated Measures

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	<p>Selected assessments have inconsistent intervals of 14, 13, 14, 15 days.</p> <p>Instructions</p> <ul style="list-style-type: none">Modify the matched columns by clicking a new column to match, selecting a previous match or editing the 'Matched Fields'.Click 'View Selected' to view only the selected columns.Click 'Next' to continue.	<p>Selected column fields</p> <table border="1"><thead><tr><th></th><th>Repeated Measure</th></tr></thead><tbody><tr><td>1</td><td>Pest Code=SEPTTR; Rating Type=PESSEV; Rating Unit=%</td></tr><tr><td>2</td><td>Pest Code=ERYSGT; Rating Type=COUDIS</td></tr><tr><td>3</td><td>Pest Code=ERYSGT; Rating Type=COUDIS</td></tr><tr><td>4</td><td>Pest Code=PHYTHB; Crop Code=ZEAMD; Rating Type=DILOGR; Rating Unit=%</td></tr><tr><td>5</td><td>Pest Code=ERYSGT; Rating Type=COUDIS; Rating Unit=PERCENT</td></tr></tbody></table>		Repeated Measure	1	Pest Code=SEPTTR; Rating Type=PESSEV; Rating Unit=%	2	Pest Code=ERYSGT; Rating Type=COUDIS	3	Pest Code=ERYSGT; Rating Type=COUDIS	4	Pest Code=PHYTHB; Crop Code=ZEAMD; Rating Type=DILOGR; Rating Unit=%	5	Pest Code=ERYSGT; Rating Type=COUDIS; Rating Unit=PERCENT
	Repeated Measure														
1	Pest Code=SEPTTR; Rating Type=PESSEV; Rating Unit=%														
2	Pest Code=ERYSGT; Rating Type=COUDIS														
3	Pest Code=ERYSGT; Rating Type=COUDIS														
4	Pest Code=PHYTHB; Crop Code=ZEAMD; Rating Type=DILOGR; Rating Unit=%														
5	Pest Code=ERYSGT; Rating Type=COUDIS; Rating Unit=PERCENT														
Crop Code															
Rating Date															
Part Rated															
Rating Type	COUDIS														
Rating Unit	PERCENT														
ARM Action Codes															

Clear Columns matched: 1-5

View Selected Next Cancel Graph Options... Help

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

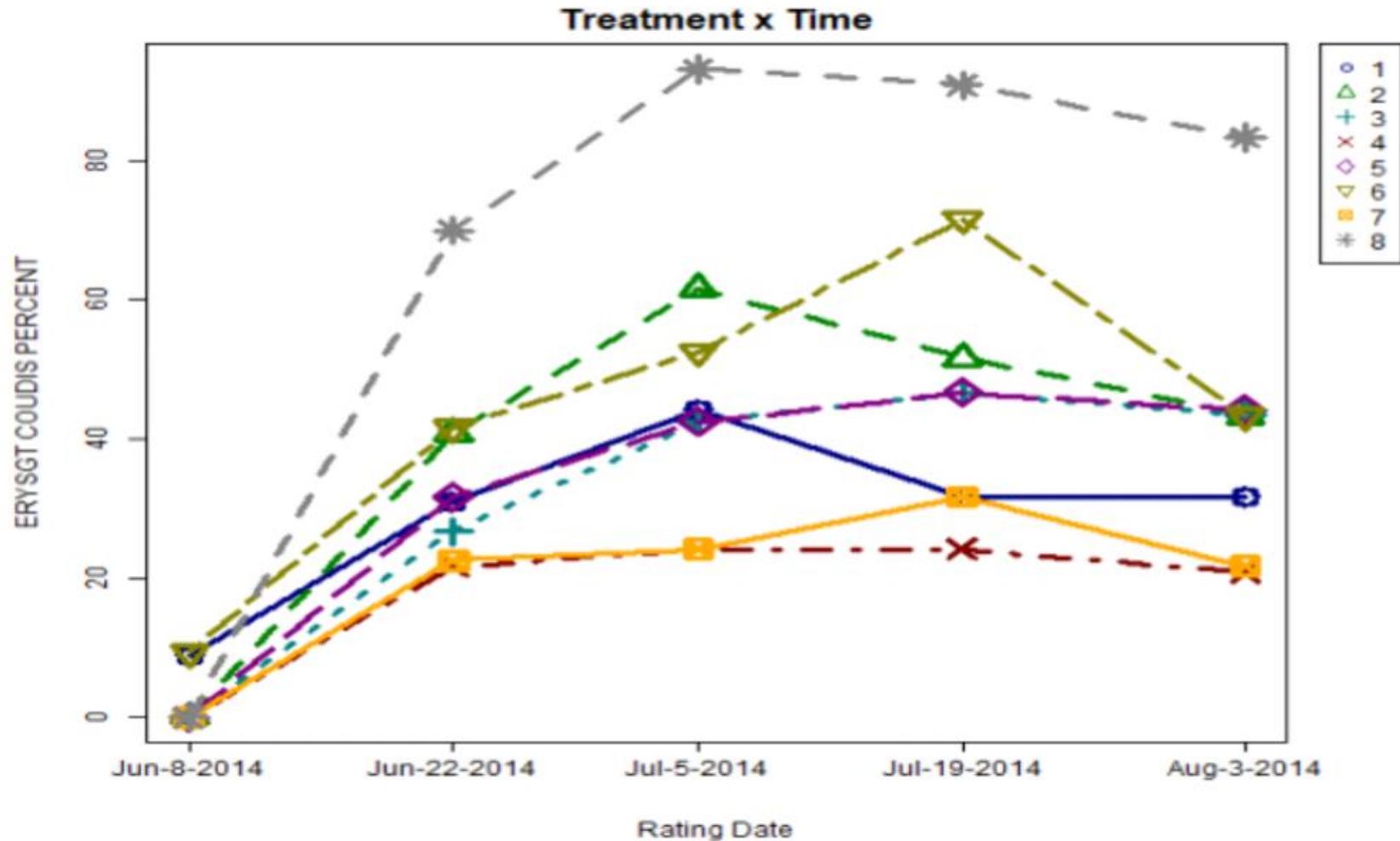
REPEATED MEASURES AOV For D ERYSGT Blumeria graminis tritici Powdery mildew of wheat TRZAW							
PLANT P COUDIS PERCENT 1							
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	HSD (.05)	Variance
Total	220.0	141626.962500					
Replicate	5.0	65.637500	13.127500	3.127	0.0195		0.223238
Treatment	7.0	51065.995833	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			
6.58			
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.



ARM 2018 Changes

Mix Size Calculator

Why use the Mix Size Calculator?

- Eliminates waste
- Predicts mix needed

Enhancement

- Calculate mix size based on current application settings.
- Press the Tool button in Mix Size field to open this dialog.
- Define **overage** so ARM can better auto-calculate product amounts canopy height changes.

Mix Size Calculator - Application A

Application volume: 200 L/ha

Mix Size

Treatments	1
Replicates	4
'Plot' EU size	38.75 m ²
Application volume	200 L/ha
Mix size unit	liters
Minimum	3.1 liters
Overage	450 mL
Calculated mix size:	3.55 liters

User-defined mix size: 3.6 liters

OK Cancel

Mix Size, Unit: 3.6 liters

Application Plan

What is the Application Plan?

- Displays all fields necessary for mix size and leaf wall area calculations.

Display from:

- Treatments Editor
- Protocol/Site Description Editor
- Spray/Seeding Plan Report

Application Plan

Selected Applications	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E	<input type="checkbox"/> F									
Settings															
Treated Plot Width	3.1 m	3.1 m	3.1 m	3.1 m	3.1 m	3.1 m									
Treated Plot Length	12.5 m	12.5 m	12.5 m	12.5 m	12.5 m	12.5 m									
Replications	4	4	4	4	4	4									
Crop Information															
Crop	1 MABSD	1 MABSD	1 MABSD	1 MABSD	1 MABSD	1 MABSD									
Row Spacing, Unit	3.10 M	3.10 M	3.10 M	3.10 M	3.10 M	3.10 M									
Rows per Plot															
Treated Canopy Height, Unit	2 m	2.5 m	2.5 m	2.5 m	2.5 m	2.5 m									
Total Canopy Height, Unit															
Treated Leaf Wall Area, Unit	12903 m ² /ha	16129 m ² /ha	16129 m ² /ha	16129 m ² /ha	16129 m ² /ha	16129 m ² /ha									
Treated Leaf Wall Area per Plot, Unit	50 m ² /plot	63 m ² /plot	63 m ² /plot	63 m ² /plot	63 m ² /plot	63 m ² /plot									
Application Information															
Application Date	Apr-2-2014	Apr-12-2014	Apr-23-2014	May-3-2014	May-12-2014	May-21-2014									
Row Sides Applied	2	2	2			2									
Spray Volume, Unit	200 L/ha	200 L/ha	200 L/ha			200 L/ha									
Mix Overage, Unit	450 mL	450 mL													
Calculated Mix Size, Unit	3.55 liters	3.55 liters	3.5			3.5 liters									
Mix Size, Unit	3.6 liters	3.9 liters													
Treatments - Line 1															
Trt Line	Trt No.	Type	Treatment Name	Fom Conc	Fom Unit	Fom Type	Specific Gravity	TGW g/100	Rate	Rate Unit	Other Rate	Other Rate Unit	Min # Appl	Appl Code	Crop ID Number
2	2	FUNG	Cyprodinil	750	G/KG	WG			0.20	kg/10000 m2 LWA				A-1	
3	3	FUNG	Cyprodinil	750	G/KG	WG			0.30	kg/10000 m2 LWA				A-1	
4	4	FUNG	Dodine 544 SC						0.05	L/ha/m CH				A-1	
5	5	FUNG	Syllit							L/10000 m2 LWA				A-1	
6	6	FUNG	Syllit							L/10000 m2 LWA				A-1	
7	7	FUNG	Cyprodinil							kg/10000 m2 LWA				A-1	
8	8	FUNG	Cyprodinil	750	G/KG	WG			0.75	kg/10000 m2 LWA				A-1	
9	9	FUNG	Syllit	400	G/L	SC			1.15	L/ha				A-1	
10	10	FUNG	Syllit	400	G/L	SC			1.5	L/ha				A-1	
11	11	FUNG	Cyprodinil	750	G/KG	WG			0.20	kg/ha				A-1	
12	12	FUNG	Cyprodinil	750	G/KG	WG			0.30	kg/ha				A-1	
1	1	CHK	Untreated												
15															

Adjust mix size and product amounts for Treated Canopy Height when LWA Application Volume unit is selected and there is a calculated Leaf Wall Area
 Identify entered Mix Sizes that are different from Calculated Mix Size +/- 5.0 %

Buttons: Help, Cancel, Next

Spatially Balanced Randomization

Why use this randomization?

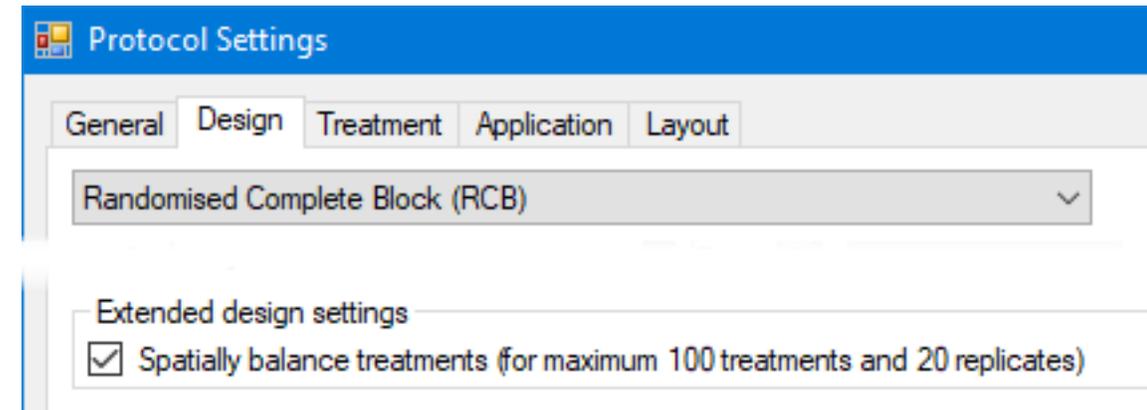
- For RCB designs, use a randomization optimized to uniformly disperse treatments across the trial.

Enhancement

- Balances average distance between all treatment pairs across replicates.

Where can you find it?

- Trial Map (Quality tab)



101 7	102 2	103 6	104 3	105 4	106 1	107 5
201 2	202 1	203 3	204 6	205 7	206 5	207 4
301 7	302 5	303 4	304 6	305 2	306 3	307 1
401 1	402 7	403 3	404 4	405 6	406 2	407 5
501 2	502 4	503 7	504 1	505 6	506 3	507 5

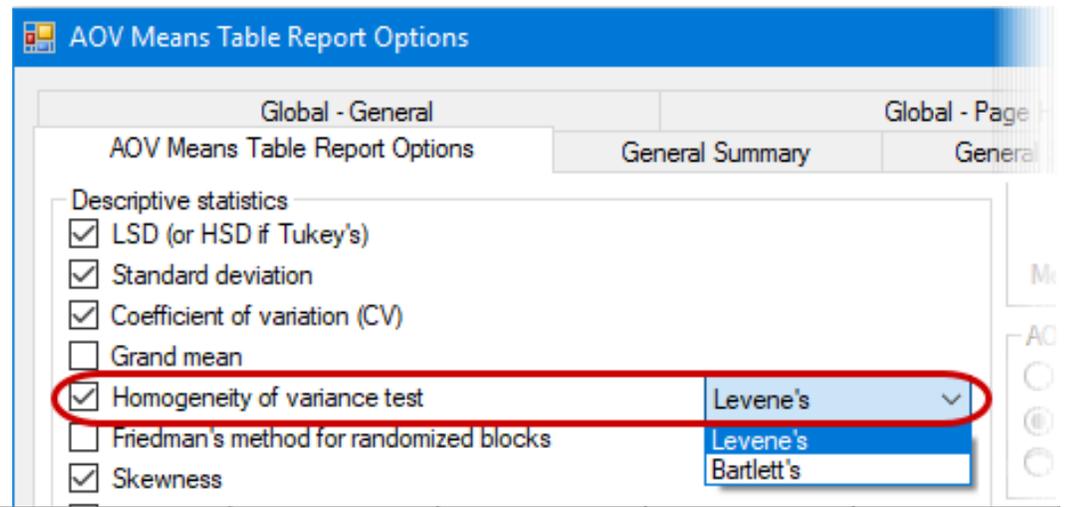
Homogeneity of Variance

Levene's Test

- Is less sensitive to departures from normality than a Bartlett's test and generally preferred.

Enhancement

- Default option and included as a descriptive statistic on the report.
- Located on the AOV Means Table Report.



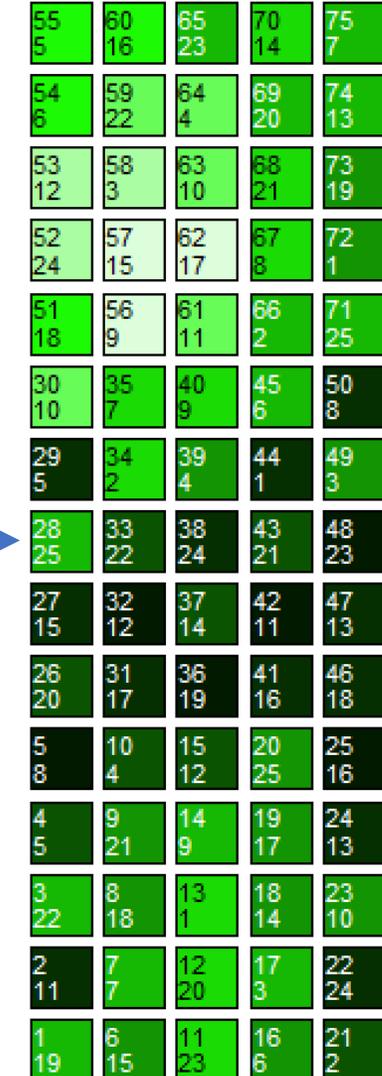
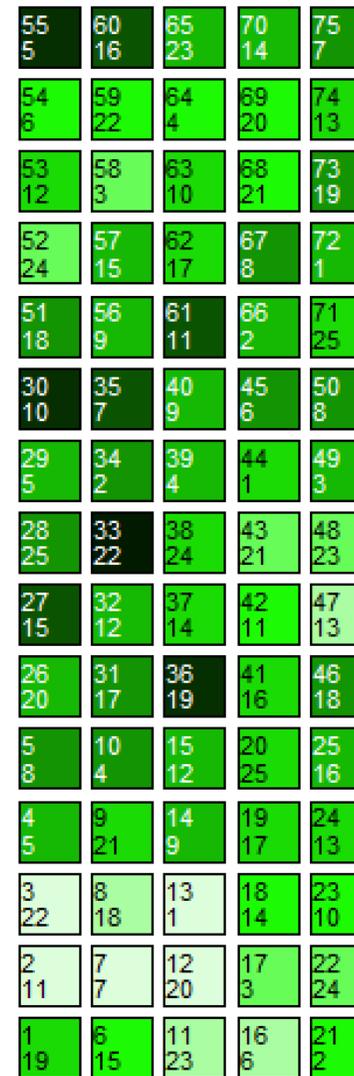
Pest Code	SEPTTR	SEPTTR	SEPTTR	SEPTTR
Pest Name	Speckled leaf >	Speckled leaf >	Speckled leaf >	Speckled leaf >
Part Rated	LEAF3 P	LEAF3 P	LEAF3 P	LEAF3 P
Rating Type	PE SSEV	PE SSEV	PESSEV	PESSEV
Rating Unit	%	%UNCK	%	%UNCK
Number of Subsamples	10	1	10	1
ARM Action Codes		TAB[3]		TAB[5]
Number of Decimals	2	2	2	2
Trt Treatment				
No. Name	3	4	5	6
Rate				
Rate Unit				
1 Untreated Check	4.55 a	0.00 b	8.25 a	0.00 b
2 Tub 0.5 Vha	1.93 b	57.98 a	1.83 b	71.65 a
3 Tub 1 Vha	1.53 b	67.06 a	1.46 b	80.07 a
4 Tilt 250 0.5 Vha	1.83 b	59.52 a	2.30 b	70.60 a
5 Mico 60 Fungol 1.5 Vha 1.25 Vha	2.70 b	39.92 a	1.67 b	71.49 a
LSD P=.05	1.264	28.202	2.598	22.408
Standard Deviation	0.821	18.305	1.686	14.544
CV	32.76	40.77	54.39	24.75
Levene's F	1.153	1.352	3.29	0.856
Levene's Prob(F)	0.37	0.297	0.04*	0.512
Skewness	0.4943	-0.4657	1.8499*	-0.8631
Kurtosis	-0.8027	-1.0584	2.6407*	-0.9292

AOV Means Table Report

Spatial Analysis

- It attempts to recover information about the hidden variables across the field.

CRD + Quadratic spatial trend AOV For TRZAW Winter wheat GRAIN C					
Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	18	5.170991 [^]			
Treatment Type III	4	1.441301	0.360325	7.676	0.0056
Blk	1	3.181476	3.181476	67.778	0.0001
Col	1	0.004818	0.004818	0.103	0.7560
Blk [^] 2	1	0.053378	0.053378	1.137	0.3140
Col [^] 2	1	0.055852	0.055852	1.190	0.3037
Blk:Col	1	0.011706	0.011706	0.249	0.6295
Error(adj)	9		0.046940		



Original

Neighbor-adjusted Fertility

AOV Means Table Report

Trend Analysis

- Analyze effects across whole field.

Nearest Neighbor Analysis

- Analyze effects only in space adjacent to individual plots.

Automatic

ARM will select best-performing model

- AIC – estimates relative quality of available models (lower is better).



AOV - Spatial Report Options

Report options: AOV Means Table | General Summary | Report Preview

Spatial Method: Automatic

Mean comparison test: LSD

Descriptive statistics:

- Spatial AIC

Crop Name	Winter wheat
Part Rated	GRAIN C
Rating Type	YIELD
Rating Unit	T-MET
ARM Action Codes	TY1
Trt No.	12*
Treatment Name	
Rate	
Rate Unit	
1 Untreated Check	7.84 b
2 Tub	0.5 l/ha 8.53 a
3 Tub	1 l/ha 8.45 a
4 Tilt 250	0.5 l/ha 8.70 a
5 Mico 60	1.5 l/ha 8.48 a
LSD P=.05	0.347
Standard Deviation	0.217
CV	2.58
Randomized Complete Block (RCB) AIC	5.1456
Spatial AIC	SPa 3.6037

SPa = Quadratic spatial trend

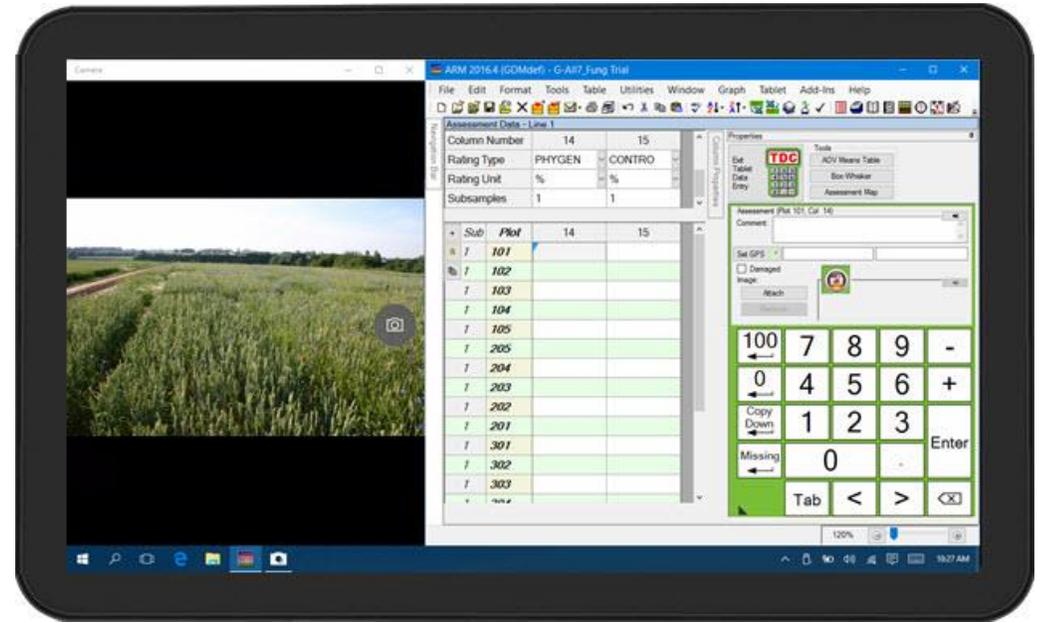
Tablet Data Collector (TDCx) Add-In

Enhancement

- Now activate ARM license serial number on your touch-enabled Windows tablet.

How does it work?

- You buy and choose your tablet.
- Install and activate your ARM license on your tablet.
- Transfer current license or purchase a NEW ARM Field license bundle.



Recommended minimum requirements to use TDCx:

Camera (6+ megapixel)

SD card or micro flash (backup)

64+ GB Internal Storage

GPS

Stylus

4+ GB RAM

Weather Data Integration

Why do we offer Weather Data Integration?

- Weather analysis explains varying product performance within efficacy trials (year, location).
- Sponsors are requiring it.
- Increased emphasis on developing bio-stimulants, plant health products – highly responsive to weather conditions.



Weather Data Integration Iteris ClearAg Collaboration

Who did we collaborate with?

- Iteris ClearAg weather and environmental content is now available by subscription to GDM clients

How does it work?

- Directly import ClearAg's **historical** and **current weather** information and **soil** data from around the world through ARM software
- Request more information about ClearAg at:
<http://info.clearag.com/ARMinfo.html>



Weather Data Integration

Site Description – New Fields Added

Daily and 30-Year average:

- Precipitation
- Air Temperature – Min/Max/Average
- Wind speed – Min/Max/Average
- Sunlight (Shortwave Radiation)

Moisture	Unit	Type	30Y	Unit	Min	Max	Avg	Temp	30Y	30Y	30Y	Unit
Total			Precipitation		Temp	Temp	Temp	Unit	Min Temp	Max Temp	Avg Temp	
0.4	mm	RAIN	1.3	mm	17	29	22	C	13	23	18	C
17.4	mm	RAIN	1.4	mm	16	24	19	C	13	22	17	C

Others:

- % Cloud Cover
- Soil Temp – Average
- Soil Moisture – Scaled 0-10cm or 0-200cm

Min	Max	Avg	Unit	% Cloud	Avg Shortwave	Unit	Avg	Unit	0-10 cm Scaled	0-200 cm Scaled
Wind	Wind	Wind		Cover	Radiation		Soil Temp		Soil Moisture	Soil Moisture
1	14	6	kph	58	143	W/m2	24	C	0.08	0.34
2	21	10	kph	62	152	W/m2	21	C	0.49	0.39



Our Mission

“Provide the research community technology to improve efficiency and accelerate innovation”

