2014 ARM "Tips and Techniques" Workshop

Topics:

1. ARM 9 changes since January 2013
2. Tablet Data Collector update
   a. Lenovo ThinkPad Tablet 2
   b. Panasonic FZ-G1
3. Choosing a tablet computer to use as a primary PC
4. ARM 10 preview

ARM 9 changes since January 2013

Presentation is available at http://gdmdata.com/documents/ARM_9.1.1_to_9.1.5_Changes.pdf.

Tablet Data Collector update

ARM Tablet Data Collector began shipping in April 2013, using Lenovo ThinkPad Tablet 2 hardware. There were several configuration changes during the year based on user feedback. The current configurations are:

1. Lenovo ThinkPad Tablet 2 with Griffin Survivor rugged case, 32 GB SD backup card, USB data transfer cable. For temperatures from 41°F to 95°F, 2 GB RAM, 64 GB drive, Intel® Atom™ processor, 1 year hardware warranty, lower cost.
2. Panasonic FZ-G1 with 32 GB SD backup card, USB data transfer cable, carrying case, Bluetooth GPS. For temperatures from 14°F to 122°F, 4 GB RAM, 128 GB drive, Intel® i5 processor, 4 foot drop resistance, IP65 certified (dustproof, very water resistant), 3 year hardware warranty, higher cost.

Choosing a tablet computer to use as a primary PC

Touchscreen tablet computers offer an easy portability, modest price, and convenience that is unmatched by traditional laptop or desktop computers. Unfortunately, many tablet computers are underpowered, with a screen that is too small to effectively manage the complex multi-document tasks involved with trial management and reporting. To use a tablet for typical PC desk work requires a tablet with:

- Windows 8 Professional.
- At minimum an Intel i5 processor with 4 GB of RAM memory and 128 GB SSD drive.
- A physical keyboard - using an on-screen keyboard is only practical for "light" tasks.
- A mouse, trackball, or touchpad - touch screens are nice, however fingers lack the precision to click on small command menus, or quickly select blocks of information to copy/paste between documents.
- An external monitor sized at least 23 inches - the 10 or 11 inch monitor on most tablets is far too small a window onto complex email and document programs such as ARM, Excel, Outlook, and Word.
- A docking station to quickly connect and disconnect attached peripherals (keyboard, pointing device, monitor, network cable, etc.)
- Frequent data backups to a physically separate device (such as an external hard drive) or location (such as a cloud). The typical way of using tablets makes them very prone to damage and theft.
- Data security to protect confidential information. Define strong passwords, protect or encrypt confidential information, put tablet to sleep before walking away.

If considering purchase of an ARM Tablet Data Collector to use as a primary PC, only the Panasonic version meets recommended minimum hardware requirements. GDM only provides the Tablet Data Collector as a package of hardware plus software.

ARM 10 preview

Power and Efficiency calculator, to help plan experiments that can successfully detect expected treatment differences:
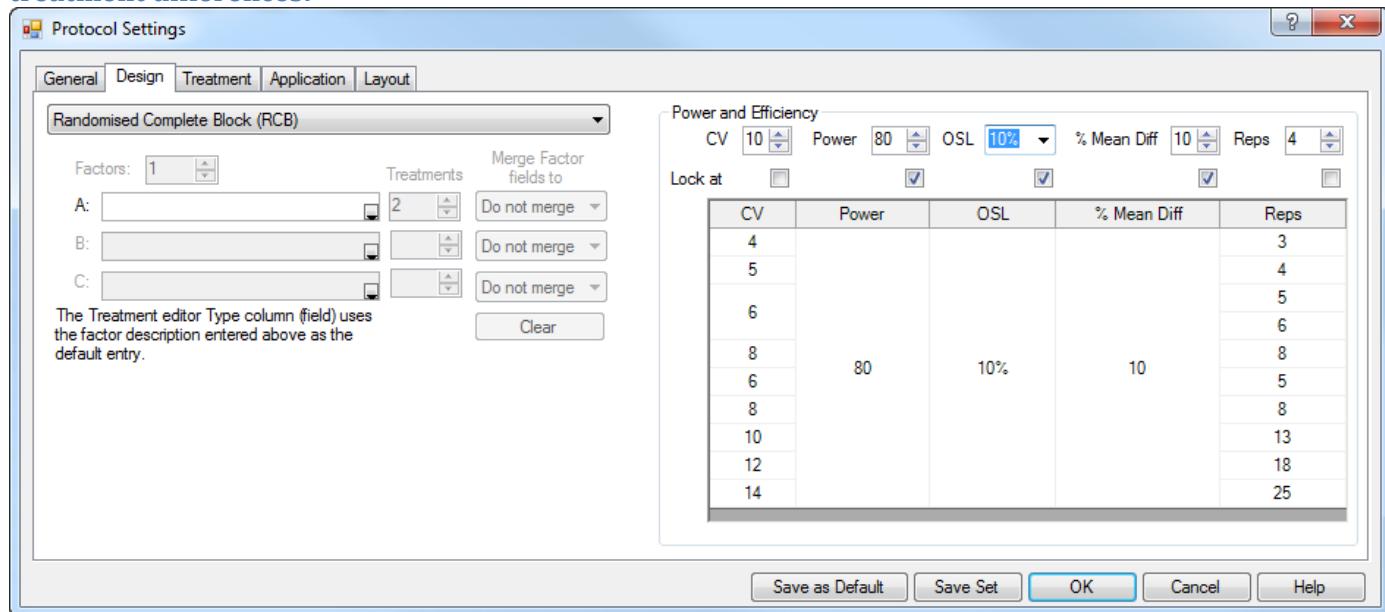
Calculate "power" of the planned trial to detect significant treatment differences based on:

- Expected CV = Coefficient of Variation of key assessments, such as yield of a cereal crop (obtain CV from AOV Means Table for comparable trials).
- Power = Level of certainty (80% or 90%) to detect true differences based on selected significance level.
- OSL = observed significance level to use, which is probability of a Type I error (a Type I error occurs when treatment means are declared to be significantly different when in fact there is no difference). Values supported by ARM are 1%, 5%, 10%, 15%, 20%, 25%, 30%, 40%, and 50%.
- % Mean Diff = desired accuracy of treatment effect expressed as percentage of the overall treatment mean. For example, to detect a 10% difference in control of pests, or a 5% crop yield difference.
- Reps = number of replications required to obtain the desired power.

Use "Lock at" to hold 3 or 4 columns constant, and leave "unlocked" the column (typically replicate or CV) for which you wish to determine possible values.

Copy study list map information to clipboard, to more easily create maps
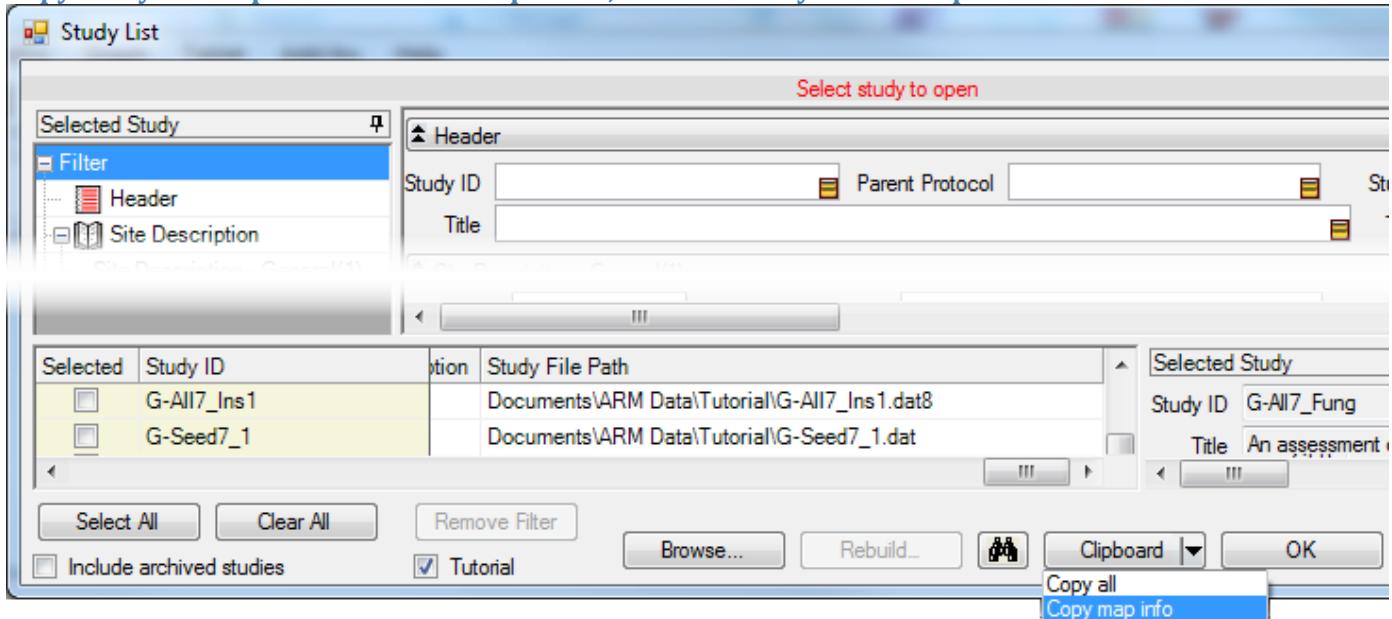
Study ID, Latitude, and Longitude are copied to clipboard, and the BatchGeo website is automatically opened. Then:

1. Click on grid under the "Copy and then paste your location data below:" prompt.
2. Press <Delete> key to clear the example data.
3. Right-click and select Paste.
4. Click "Map Now" button.

Print Reports dialog enhancements for Report Options and Preview
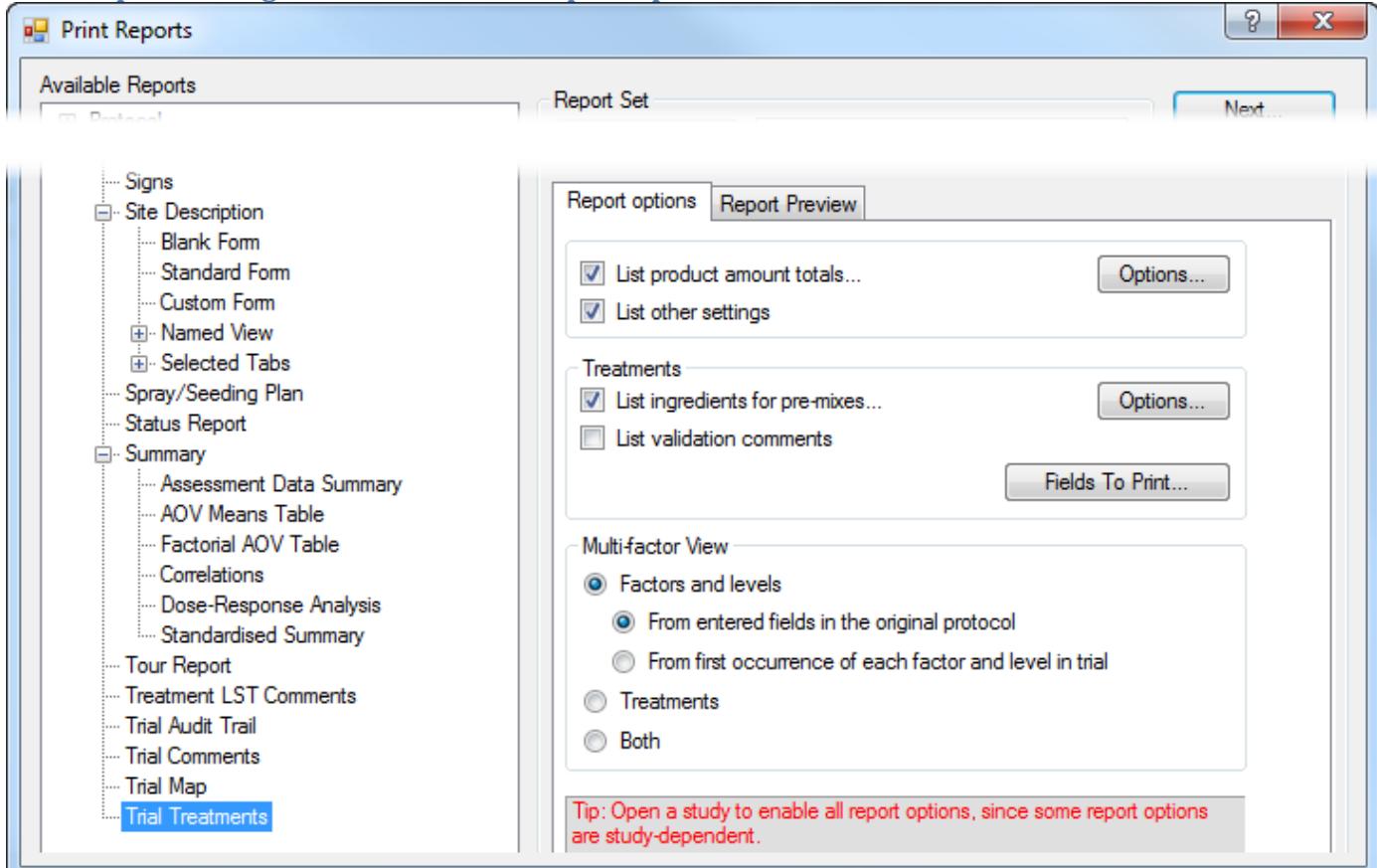
- Set options for the current report directly on the Print Reports dialog. Select "Edit Report Options" only to change Global Report Settings, or options for a parent report (such as Summary options for AOV Means Table report).
- After selecting the Report Preview tab, the tab stays open so you can click different reports to have an "instant preview" of what the report looks like for the current study. Finding a desired label is now much faster!
- Print Reports automatically resizes according to current screen resolution, giving a larger view of Report Options and Print Preview on a higher resolution monitor.

Named settings on Settings window in protocols
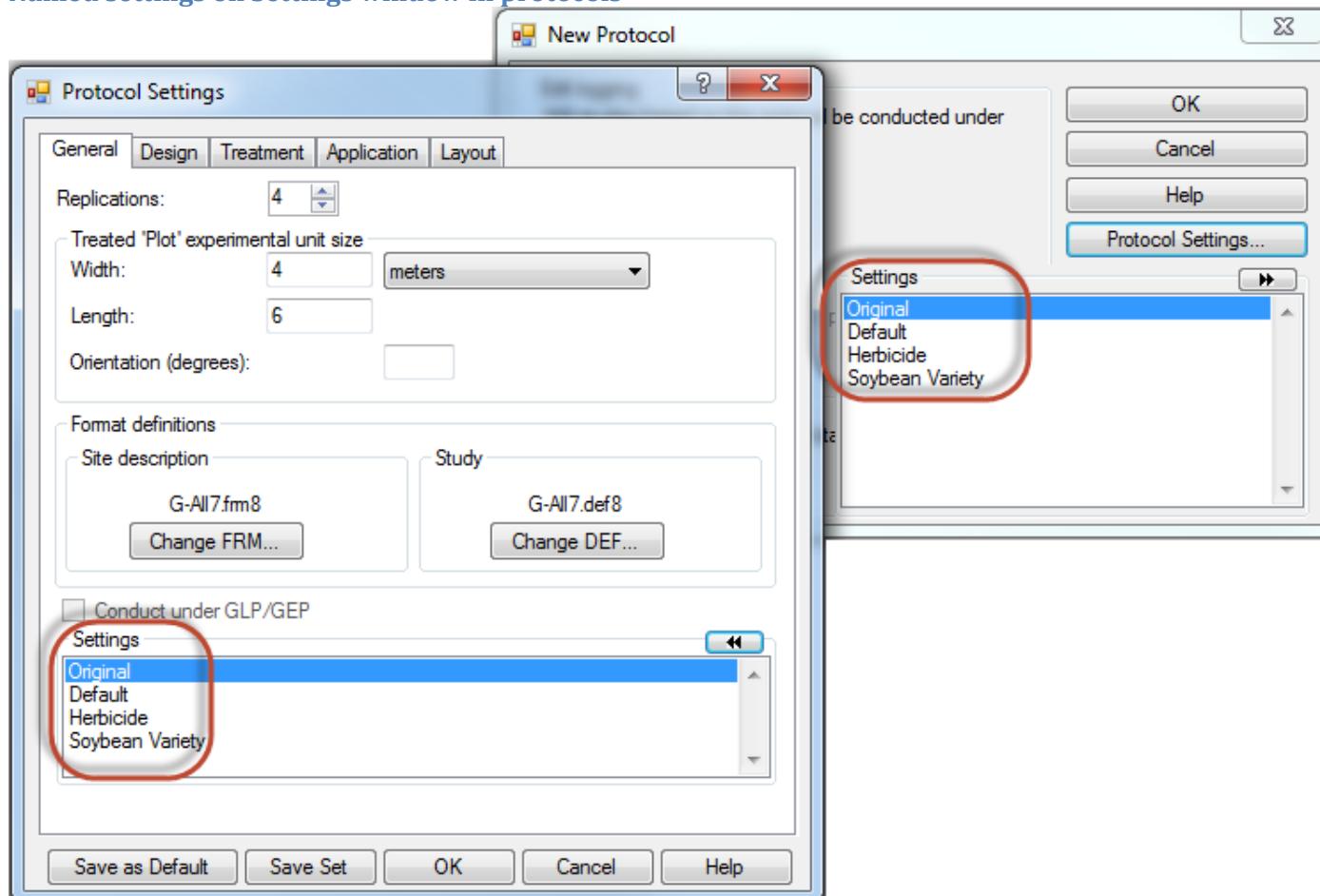
Create named option sets using "Save Set" button, and select a named option set to use in either the New Protocol dialog, or General tab of Settings in a protocol.

Find possible outliers while reviewing assessment data
Use the new "Column Properties" tab in Assessment Editor to display information about each assessment data in each data column. It displays:

- Any currently defined minimum maximum data range
- Lowest and highest value in data column
- Description of transform applied to a data column
- Full descriptive statistics from AOV of data
- Any violations of AOV assumptions, with a "Fix" button to try solving the violation
- Tool to find Outliers based on several different methods to detect possible outliers, with a "Find Next" button to locate each outlier in the data column.
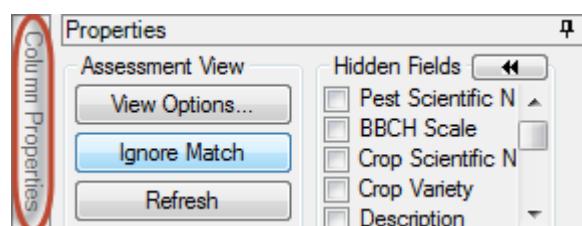
Assessment Data - Line 1

Column Number	5
Pest Type	D ⬇ Disease
Pest Code	SEPTTR ⬇
Pest Name	Speckled leaf blotc ⬇
Crop Code	TRZAW ⬇
Crop Name	Winter wheat ⬇
Part Rated	LEAF3 ⬇ P ⬇
Rating Date	Jun-18-2008 ⬇
Rating Type	PESSEV ⬇ CO
Rating Unit	% ⬇ %U
Number of Subsamples	10
Assessed By	⬇
Rating Timing	2 ⬇
Days After First/Last Applic.	64
Trt-Eval Interval	15 DA-B
Days After Emergence	
ARM Action Codes	⬇ —
Number of Decimals	2

Column 5 Properties ⯗

Previous	Next

Column ID:	5	
Column flags:	Original	
Min/Max entry:	0	100
Low/High value:	0.00	15.00

Descriptive Statistics — Refresh

LSD	2.598
Standard Deviation	1.686
CV	54.387
Grand Mean	3.1
Bartlett's X2	15.5
P(Bartlett's X2)	0.004
Friedman's X2	8.4
P(Friedman's X2)	0.078
Skewness	1.8499
Kurtosis	2.6407
Replicate F	0.625
Replicate Prob(F)	0.6123
Treatment F	11.778
Treatment Prob(F)	0.0004

+	Sub	Rp	Bk	Col	Plot ▲	Trt	5
🔒 1	1	1	1	101	3	0.8
📋 2	1	1	1	101	3	0.00
3	1	1	1	101	3	2.00
4	1	1	1	101	3	1.00
5	1	1	1	101	3	0.00
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	7.70

❌ Does not meet assumptions of AOV: data has heterogeneity of variance/skewness/kurtosis

[Fix]

Outliers
- ◉ Box-Whisker
- ○ > +/- 2 standard deviations from grand mean
- ○ > +/- 3 standard deviations from grand mean

☑ Skip damaged assessments
☐ Based on subsample values

[Find Next]

"Fix" button:

+	Sub	Rp	Bk	Col	Plot ▲	Trt	5
🔒 1	4	4	1	401	1	13
📋 2	4	4	1	401	1	10.00
3	4	4	1	401	1	11.00
4						
5						
6						
7						
8						
9						
10						
1						

❌ Does not meet assumptions of AOV: data has heterogeneity of variance/skewness/kurtosis

(Fix)

ARM - SPECIAL CONFIRMATION

⚠ Apply automatic data correction transformation 'Log(n+1)' to data column 5 to correct ?

[Yes] [No] [Help]

Sort data by any 'plot' experimental unit description column

+ Sub	Rp	Bk	Col	Plot	Trt	3
1	4	4	5	405	5	10.00
1	4	4	4	404	4	0.00
1	4	4	3	403	2	3.00
1	4	4	2	402	3	0.00
1	4	4	1	401	1	0.00
1	3	3	5	305	4	3.00
1	3	3	4	304	5	0.00

Click the column heading once to sort data in ascending order of values in that plot description column, such as Rep or Block. Click a second time to sort data in descending order.