

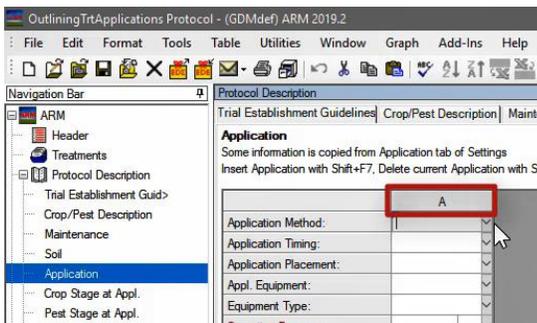
Outlining Treatment Applications



In this video:

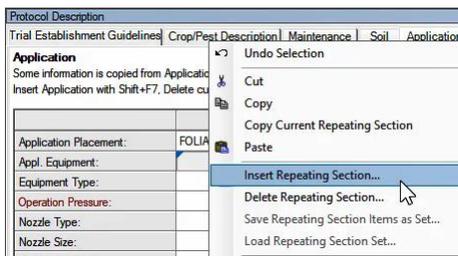
- Adding an application
 - Using a Repeating Section
- Link applications to treatment components
- Mix Size Calculator
 - Spray volume and mix size

In this video, we discuss how to plan treatment applications within an ARM protocol. We will add applications to a study using a repeating section, link the applications to individual treatment line components, and use the Mix Size Calculator to plan appropriate Spray Volume and Mix Size settings for each application.



We start by opening the tutorial protocol 'OutliningTrtApplications'.

An application is documented within a protocol on the Application tab of the Protocol Description. Applications are denoted with letters instead of numbers, so here we see the first application of the study is called Application Code A. Describe the method and timing of the application, and optionally any requirements of the equipment to use. (In the trial we document the actual equipment used.)



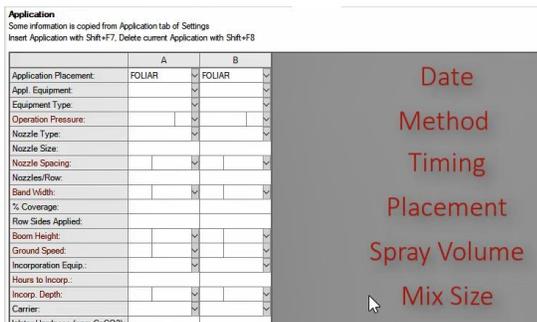
To add a second planned application, either use the right-click menu or the Properties panel to Insert a Repeating Section.

Repeating Section

- Grouped set of ARM fields
 - E.g. table row or column
- Describes a single entity
- Replicated to document >1 entity
 - E.g. application, crop, pest/weed

Application Description	A	B	C
Application Date	May 12 2018	May 23 2018	May 6 2018
App. Date Time			
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	BEFORE	AFTER	AFTER
Application Placement	FOLIAR	FOLIAR	FOLIAR
App. Temperature Start Stop	80 C	70 F	70 C
Soil Moisture Start Stop	2 MPH SE 3	10 S 1	10 S 1
Soil Temperature (In)	52 F	62 F	65 F
Soil Moisture	50 MET	50 MET	50 MET
% Cloud Cover	50	50	50

A Repeating Section is a grouped set of fields in ARM, often in a table row or column, that describe a single entity. This group can be replicated in order to document more than one such entity, like an application on this tab, or describing multiple crops or pests under study.



This second application could be for a later date where the same treatments are applied a second time. Or it could be the same day as application A, but for a different set of treatments requiring different equipment.

A rule of thumb for whether you need to define additional applications: if one of the important fields in this table is different for a given treatment, then it should be given a different application code. This would include: Application Date, Method, Timing, Placement, Spray Volume, and Mix Size.

Outlining Treatment Applications



Other Rate	Other Rate Unit	Growth Stage	Min # Appl	Appl Code	Appl Description
2.67	LB A/A			AB	
3.12	LB A/A				
0.335	LB A/A				
0.89	LB A/A				

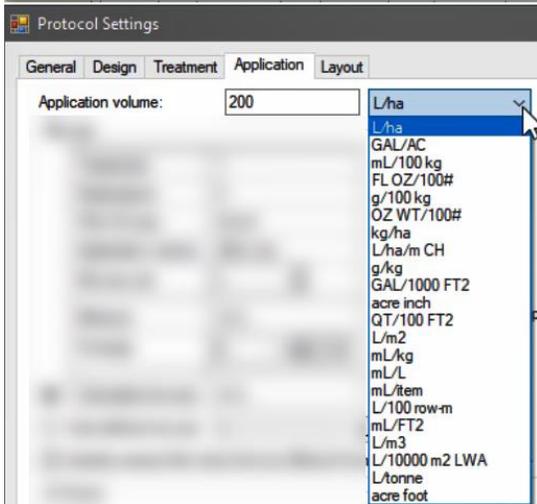
Now that we have defined our applications, we need to link which treatments will be applied during each of these applications. This is done on the Treatments editor. In the Application Code field, enter the application letters of each application that this particular treatment line component will be used in. For example, if treatment 2 was to be applied at both a pre- and post-emergence application, then 'AB' would be entered.

Min # Appl	Appl Code	Appl Description	Crop ID Number
	A	Foliar at disease onset	
	A	Foliar at disease onset	
	B	Foliar tank mix at disease onset	
	B	Foliar tank mix at disease onset	

In our example, treatments 2 and 3 are applied with the same equipment - Application A, and then both components of treatment 4 are applied together as a tank mix as Application B on the same date. (You can use the Application Description field as a short description of the application for easy reference.)

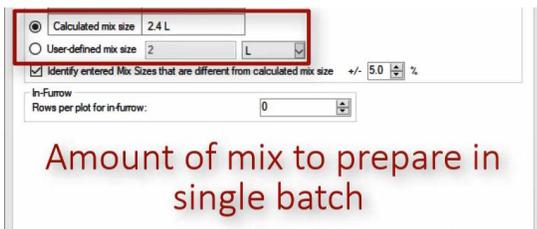


When it comes time to make an application, ARM calculates the amount of product to measure for each treatment that is being applied. But first, we must tell ARM the application volume and the mix size that will be used to make this application, which can be entered on the Application tab of the Settings dialog.



The Application Volume is the amount or volume *per unit area* to use when applying treatments. In our example, we dilute treatments in water before application, so our Application Volume is the amount of water plus formulated product that is physically applied to our plots.

(There are also units for many other application types that are supported in ARM, like seed treatments or leaf wall area applications.)



Next, we set the Mix Size - the amount of mix that is to be prepared in a single "batch". Depending on your equipment, this would ideally be the total amount of mix that will be applied for a single treatment across all replicates, so only have to measure each product once.



Mix size

Treatments	1
Replications	5
'Plot' EU size	24 m2
Application volume	200 L/ha
Mix size unit	L
Minimum	2.4 L
Overage:	10 %
Calculated mix size	2.64 L
User-defined mix size	2 L

2.4 L based on size; 200 L/ha

Identify entered Mix Sizes that are different from calculated mix

Here on the Mix Size Calculator, ARM calculates the minimum amount of mix needed to cover the area of 1 treatment across all reps, based on the plot size and application volume.

Then, enter an Overage value if desired, to account for filling the lines or to ensure proper coverage. This overage can be specified as a percent of the calculated amount, or a set volume in milliliters or liters. Then ARM will use the 'Calculated Mix Size' which is the minimum mix plus any overage defined.

Alternatively, you can hand-type a known mix size value in the User-defined mix size. But it is recommended to use the mix size calculator instead, as ARM can better calculate Product Amount Totals when it knows the exact overage amount.

Application

Some information is copied from Application tab of Settings
 Insert Application with Shift+F7. Delete current Application with Shift+F8

Water Hardness (ppm CaCO3):	
Spray Volume:	250 L/ha
Mix Overage:	
Mix Size:	
Spray pH:	

The Settings values are used as the default for all applications in the study. However, if different equipment is used in different applications, then we can specify different Spray Volume and Mix Sizes on the Application tab of the Protocol Description.

When we click into the Spray Volume field, it is auto-filled with the information from the study settings, but we can easily adjust these values for this particular application.

Mix Size Calculator - Application B

Application volume: 250 L/ha

for Application	B
Treatments	1
Replicates	5
'Plot' EU size	24 m2
Application volume	250 L/ha
Mix size unit	L
Minimum	3 L
Overage	400 mL
Calculated mix size	3.4 L
User-defined mix size	3.3 L

OK Cancel

Click on the Tool icon in the Mix Size field to display the Mix Size Calculator as we saw before, to help calculate an appropriate Mix Size for this application.

Note that there are also fields on the Treatments editor for Mix Size and Spray Volume. It is not recommended to enter information there, however. ARM first looks in the site description when making product calculations, and it is much clearer when this information is defined all in one place with the other application information.

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Instructions for applications

Application Directions:

Finally, use the Application Directions field to provide further instructions for the trialist about these applications.

This is a large comments field that supports Rich Text, which is text with formatting (such as font type, size, color, or bolding). These fields support tables and images too, and so it is very easy to paste content from a Word document into one of these "RTF" fields.