

Data Collection

BMS 16.0-17.0 Manual

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About

Once you have a dataset established you can start collecting data for your study. Datasets can be loaded/downloaded from studies in 3 different ways.

- 1. Inline editing
- 2. Study Book file export and import
- 3. BMS connection to BrAPI enabled applications*

* The Breeding Management System is plug-and-play compatible with BrAPI enabled applications. However each of these applications is different and developed independently of the Integrated Breeding Platform. If you are interested in using BrAPI enabled applications, please see the developer's user documentation for more information.

Inline Edits

You can modify trait observations by directly clicking on them and typing.

• Click on a cell that you want to modify and edit. Once you leave the cell, the edit is automatically accepted to the database.

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File Export/Import

The BMS allows you to export/import the Study Book in spreadsheet format (.xls,.csv).

 Click on Actions>Data Collection Options>Export study book to download the study book file. Then select the study instances that you want to consider for download.

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	Observations Define Observation Image: Construction Select Environment Batch Action	vation De ns nt: 1-7 ns	tails urangabad ▼	Filter by statu	JS: All	×				Export study bo Import Observa Export germpla	ok tions sm list ACC Show Cat	Field map options > Data collection options Execute calculated variable Create genotyping samples Advance study options > Close study Delete study Lock Study
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	Test entry Test entry	74	H43402	2	2 3							
	Test entry	3	H-002	5	5							

Green column headers indicate calculated variables that the BMS can dervive from formulas and inputs.

• If your study has more than one dataset, choose the appropriate one and Continue.

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INFORMATION MANAGEMENT	Settings	Germplasm & Checks	Treatment Factors	DATASET				
 STATISTICAL ANALYSIS 	# Obs	ervations		Please choose the dataset you would like to export: *				
PROGRAM ADMINISTRATION				Observations *				
	Observa	ations		Observations				
	► Def	fine Observation Details		Plants: 5 Plants				
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File Format

Observation, or plot-level, datasets have several export format options. Sub-observation data sets only offer .csv format - expect expanded options for sub-observations datasets in upcoming releases. **Note:** If you export more than one instance at a time you'll get a .zip file containing on excel/csv per instance.

- · CSV: This format is compatible with a variety of applications
- Excel: This format is compatible with the DIB handheld data capture application.
- Fieldbook KSU: Format compatible with the KSU fieldbook data capture application (.csv & .xls)
- Select the export format and the data collection order. Serpentine data collection order is available after a field map has been created (see more <u>Make Field Map</u>).

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	► Define Obse	rvation	Details		Choo	ose a data collection order *	Plot Order	· 0			
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					10	•	Search:				
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	Test entry	74		2		2	Bengaluru - (BENG)				
	Test entry	1		3		3	Davangere - (DAV)				
	Test entry	2		4		4	Hydrerabad - (HYD)				
	Test entry	3	DH-003	5		5	Jalandhar - (JALA)				
	Test entry	4	DH-004	6		6	Udaipur - (UDAI)				
	Test entry	5	DH-005	/	Show	ing 1 to 6 of 6 optrior					
	Test entry	0	Hub10.002	0	31104	ing i to o or o entries					
	Test entry	2	Hyb19-002	10			< 1 >				
	Test entry	9	Hyb19-003	11							
	Test entry			12			Cancel				
	Test entry		Hyb19-006	13	13						

The exported file is ready for data entry or for label printing using external applications, like Excel or Bartender.

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1	LOCATION_	N PlotArea_m	2 SEEDING_D	A ENTRY_TYP	PE GID	DESIGNATIO	ENTRY_NO	OBS_UNIT_	I PLOT_NO	Silk_Date_ymd	Ant_Date_ymd	GY_DW_kgPlot	GY_DW_tha	Silk_DT_day	Ant_DT_day	ASI_Cmp_da	PH_M_cn
2	Aurangabad	7.5	3/28/19	ЭТ	73	HM11	1	7b86b308-fc	: 1	L							
3	Aurangabad	7.5	3/28/19	ЭТ	74	EH43402	2	3dab99ff-89	1 2	2							
4	Aurangabad	7.5	3/28/19	ЭТ	1	DH-001	3	e749d64b-8	2 3	5							
5	Aurangabad	7.5	3/28/19	ЭT	2	DH-002	4	Ocfd6c1b-58	ia 2	L							
6	Aurangabad	7.5	3/28/19	Ŧ	3	DH-003	5	2de796cb-ed	c 5	5							
7	Aurangabad	7.5	3/28/19	Ŧ	4	DH-004	6	cff68344-6a	9 E	5							
8	Aurangabad	7.5	3/28/19	Ŧ	5	DH-005	7	b5b1db0a-2	k 7	7							
9	Aurangabad	7.5	3/28/19	Ŧ	6	Hyb19-001	8	8b297a32-d	f 8	8							
10	Aurangabad	1 7.5	3/28/19	Ŧ	7	Hyb19-002	9	c4513d77-7	1 9	9							
11	Aurangabad	1 7.5	3/28/19	Ŧ	8	Hyb19-003	10	8124f8b7-c2	2 10	D							
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		Empty Perfe	ormance Tr	ial Templat	Shee	1 +											

Notice that the study book file includes OBS_UNIT_ID - a unique observation id suitable for barcode labeling of individual observations. The studybook also includes empty columns of data for calculated variables. You have the option to load pre-calculated data or to leave blank and let the BMS perform the calculation.

A	В	С	D	E	F	G	н	1	J	к	L
TUDY	SparseTrial										
ITLE	Sparse Trial										
BIECTIVE	SparseTrial										
TART DATE	20201111										
ND DATE	LOLOTITI										
TUDY TYPE	Trial										
	1160										
TUDY DETAILS	DESCRIPTION	ONTOLOGY ID	PROPERTY	SCALE	METHOD	DATA TYPE	VALUE	DATASET			
rop season Code	Season - Assigned (Code)		Season	Code of Crop season	Assigned	C	MS	STUDY			
Project Prefix	Project Prefix BCID Variable		Breeding Project	Project Prefix Scale	Assigned	С	PB	STUDY			
amet Region	Tarnet Region Variable		Tarnet Region	Tarnet Region Scale	Assigned	C	R3	STUDY			
NAME ID	Principal investigator - assign	ed (DBID)	Person	Person id	Assigned	c	5	STUDY			
	Principal investigator - assign	and (DBCV)	Person	Person name	Assigned	c	Christopher McLaren	STUDY			
1_nosme	Thirdpar investigator - assign	ieu (bbcv)	1 613011	r eraon name	Aaagiiou	0	officiatopher mozaren	01001			
XPERIMENTAL DESI	G DESCRIPTION	ONTOLOGY ID	PROPERTY	SCALE	METHOD	DATA TYPE	VALUE	DATASET			
LOT_NO	Field plot - enumerated (num	iber)	Field plot	Number	Enumerated	N		PLOT			
REP NO	Replication - assigned (numb	er)	Replication factor	Number	Enumerated	N		PLOT			
BLOCK NO	Block - assigned (number)		Blocking factor	Number	Enumerated	N		PLOT			
ENVIRONMENT DETA	IL DESCRIPTION	ONTOLOGY ID	PROPERTY	SCALE	METHOD	DATA TYPE	VALUE	DATASET			
RIAL INSTANCE	Trial instance - enumerated (number)	Trial instance	Number	Enumerated	N		1 ENVIRONMENT			
OCATION ID	Location - selected (DBID)		Location	Location id	Assigned	С	10001	ENVIRONMENT			
OCATION NAME	Location - selected (DBCV)		Location	Location name	Assigned	C	CGMSITE01	ENVIRONMENT			
SEEDING DATE	Date Seeded - applied (see	mmdd)	Planting date	Date (searmedd) of S	Applied	D	COMOTIECT	ENVIRONMENT			
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	Disal: Circ (as is as malate bis	experiment	ED - hieg	Number	Assigned	IN AL		E ENVIRONMENT			
NOT DEGION	Block Size for Incomplete blo	ck designs	ED - DIOCK SIZE	Trans of EXPT, DEOLO	Assigned	N O	DIDD	5 ENVIRONMENT			
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ENVIRONMENTAL CO	NI DESCRIPTION	ONTOLOGY ID	PROPERTY	SCALE	METHOD	DATA TYPE	VALUE	DATASET			
GERMPLASM DESCRI	P DESCRIPTION	ONTOLOGY ID	PROPERTY	SCALE	METHOD	DATA TYPE	VALUE	DATASET			
NTRY TYPE	Entry type (test/check)- assig	ned (type)	Entry type	Type of ENTRY TYPE	Assigned	С		PLOT			
ND	Germplasm identifier - assign	ed (DBID)	Germplasm id	Germplasm id	Assigned	C		PLOT			
DESIGNATION	Germplasm identifier - assign	ed (DBCV)	Germplasm id	Germplasm name	Assigned	C		PLOT			
NTRY NO	Germplasm entry - enumerate	ed (number)	Gemplasm entry	Number	Enumerated	N		PLOT			
DRS LINIT ID	Field observation unit id - ass	signed (text)	Field plot	Text	Assigned	т		PLOT			
20000	The nediame string of the ge	amolasm	Cross history	Text	Accigned	T		PLOT			
SEED SOURCE	Seed source - Selected (Cod	la)	Seed source	Code of SEED, SOLIE	Selected	T		PLOT			
LED_000RDE	Concersion - Selected (Con		ouco source	0000 0. DEED_000F	00100100			1 201			
DBSERVATION UNIT	DESCRIPTION	ONTOLOGY ID	PROPERTY	SCALE	METHOD	DATA TYPE	VALUE	DATASET			
RAITS	DESCRIPTION	ONTOLOGY ID	PROPERTY	SCALE	METHOD	DATA TYPE	VALUE	DATASET			
GY_Adj_tha	Grain yield BY Adjusted GY	CO_322:0000731	Grain yield	t/ha	Adjusted GY - 0	Con N	All values allowed	PLOT			
PH M cm	Plant height BY PH - Measur	rement IN cm	Plant height	cm	PH - Measurem	ent N	All values allowed	PLOT			
	-										
BELECTIONS	DESCRIPTION	ONTOLOGY ID	PROPERTY	SCALE	METHOD	DATA TYPE	VALUE	DATASET			

Study Book exported as an .xls file contains a Description Sheet with metadata about the trial in addition to the Observation Sheet, where plot/plant/subsample data is recorded.

Record Observations

Record observations and save file.

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120 kg/ha ur	r ELO	9017	Aurangabad	7.5	3/28/19	т	73	HM11	1	7b86b308-fc	1	20190513	20190513	0.1213				
120 kg/ha ur	r ELO	9017	Aurangabad	7.5	3/28/19	Т	74	EH43402	2	3dab99ff-89	2	20190511	20190511	0.0776				
120 kg/ha ur	r ELO	9017	Aurangabad	7.5	3/28/19	Т	1	DH-001	3	e749d64b-82	3	20190512	20190512	0.1023				
120 kg/ha ur	ELO	9017	Aurangabad	7.5	3/28/19	т	2	DH-002	4	Ocfd6c1b-58	4	20190512	20190515	0.0519				
120 kg/ha ur	r ELO	9017	Aurangabad	7.5	3/28/19	т	3	DH-003	5	2de796cb-ec	5	20190513	20190513	0.1069				
120 kg/ha u	r ELO	9017	Aurangabad	7.5	3/28/19	т	4	DH-004	6	cff68344-6a	6	20190512	20190516	0.0336				
120 kg/ha u	r ELO	9017	Aurangabad	7.5	3/28/19	т	5	DH-005	7	b5b1db0a-2b	7	20190513	20190517	0.0319				
120 kg/ha ur	r ELO	9017	Aurangabad	7.5	3/28/19	т	6	Hyb19-001	8	8b297a32-df	8	20190513	20190514	0.1186				
120 kg/ha ur	r ELO	9017	Aurangabad	7.5	3/28/19	т	7	Hyb19-002	9	c4513d77-71	9	20190511	20190513	0.0491				
120 kg/ha u	r ELO	9017	Aurangabad	7.5	3/28/19	т	8	Hyb19-003	10	8124f8b7-c2	10	20190513	20190518	0.0817				
		Trial Tamp				-												
	enormance	mai temp	late_All	+														

Observations have added to the columns corresponding to raw data traits. The calculated traits are left empty for BMS calulations later.

Import

· Click on Actions>Data Collection Options>Import Observations to browse for the file to upload

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Manage Studies	👻 Perform	ance Trial	Template		Save						Ret	urn to Manage Studies
Manage Samples	BASIC DET	TAILS										Actions
► INFORMATION MANAGEMENT	Settings Ger	mplasm & Ch	ecks Treatmen	t Factors En	vironments	Experimental Design	Observations	Plants: 5 Plants				Design and planning options >
STATISTICAL ANALYSIS	# Observat	ions									0	Prossing options → Dbservation unit options →
PROGRAM ADMINISTRATION											F	ield map options >
	Observations	5								Export study book	0	Data collection options
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	Select Enviro	onment. 1	Aurangabad	Piller by stat	US. All	<u> </u>					Show Call	Delete study
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	ENTRY_TY	PE T GID T		ENTRY_NO	PLOT_NO	Silk_Date_ymd 🔻	Ant_Date_ymd 🔻	GY_DW_kgPlot ▼	GY_DW_tha 🔻	Silk_DT_day T	Ant_DT_day	ASI_Cmp_c
	Test entry	73	HM11	1	1	20190512		0.0987	13.16			
	Test entry	74	EH43402	2	2							
	Test entry	1	DH-001	3	3							
	Test entry	2	DH-002	4	4							
	Test entry	3	DH-003	5	5							
	Test entry	4	DH-004	6	6							
	Test entry	5	DH-005	7	7							

• Select the appropriate dataset. Continue.

 BREEDING ACTIVITIES Manage Germplasm 	MAIZE 3 MANAGE STUDIES @		Site Admin	My Programs 🚺 😯 ᆽ admin 👻
Manage Studies Manage Samples	 Performance Trial Template BASIC DETAILS 	Import observations	×	Return to Manage Studies
INFORMATION MANAGEMENT STATISTICAL ANALYSIS	Settings Germplasm & Checks Treatment Factors	* indicates a mandatory field DATASET		
▶ PROGRAM ADMINISTRATION	Observations	Please choose the dataset you would like to import: * Observations		
	Define Observation Details Deservations	Cancel Continue		ACCEPTED PENDING
	Select Environment: 1 - Aurangabad * Filter by : Batch Actions	status: Ali •		Show Categorical Description
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• Select file type and specify file. Import.

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Manage Germplasm	MANAGE STUDIES @					
Manage Studies	🚏 Performance Trial Template	Import chromotions			Retu	irn to Manage Studies
Manage Samples	BASIC DETAILS	Import observations				Actions
► INFORMATION MANAGEMENT	Settings Germplasm & Checks Treatment Factors	* indicates a mandatory field EXPORT FORMAT				
STATISTICAL ANALYSIS	# Observations	Please specify the format you are importing:*	CSV v			
► PROGRAM ADMINISTRATION	Observations	SELECT FILE				
	Define Observation Details	Please choose the file you would like to import:*	Performance Trial Te 💥			
	Dbservations	Back			ACCEPTE	PENDING
	Select Environment: 1 - Aurangabad * Filter by				Show Categori	cal Description
	Batch Actions					

Pending Data

Pending view flags out of bound data and reveals if data will be over written. Data staging in pending view allows the Breeding Management System to accept data without overwriting existing data. Data staging provides an important quality control step, especially now that the system can except data automatically via <u>BrAPI</u> from external applications, like digital scales and handheld data capture apps.

• At this point you can review the imported data. If there is a problem, you can Accept or Discard the whole dataset or

manually modify the problematic values (see below).

REEDING ACTIVITIES	< 🖪	MAIZE 3						Site Admin	My Programs	🤨 😯 喿 adr
Manage Germplasm	MANA	AGE STUDIES	0							
Manage Studies	🛛 💡 Perfo	ormance Trial Ter	nplate	Save					Ret	urn to Manage Studies
Manage Samples	► BASI	C DETAILS								
FORMATION MANAGEMENT										Actions
	Settings	Germplasm & Checks	Treatment Factors	Environment	s Experimental Design	Observations	Plants: 5 Plants			
ATISTICAL ANALYSIS	# Obse	ervations								
OGRAM ADMINISTRATION		1								
	Observa	tions								
	► Def	ine Observation Detail	s							
	n Di	bservations							ACCENTS	D PENDING
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									Acce	ept Discard
	Select	Environment: All envi	ronments v Filter	by status: All	٠				Accel	pt Discard
	Select	Environment: All environment	ronments • Filter	by status: All	•				According Show Category	pt Discard
	Select	Environment: All envi	ronments v Filter	by status: All	٠				Acco	pt Discard
	Select B. TRIAL	Environment: All envir atch Actions	ronments • Filter	by status: All	▼ ON ▼ ENTRY_NO ▼	PLOT_NO Y	Silk Date ymd ¥	Ant_Date_ymd	Acco Show Categor	ept Discard ical Description
	Select B TRIAL 1	Environment: All environment: All environment: All environment: atch Actions	ronments v Filter TRY_TYPE V GII st entry 73	by status: All	• ON ¥ ENTRY_NO ¥ 1	PLOT_NO ♥ 1	Silk, Date, ymd ¥ 20190513 (20190512)	Ant_Date_ymd // 20190513	Acce Show Categor GY_DW_kq 0.1213 (0.1	pt Discard ical Description B gPlot ¥ 0967)
	Select B TRIAL 1 2	Environment: All envir atch Actions	TRY_TYPE V GIL st entry 73 st entry 73	by status: All Y DESIGNATI HM11 HM11	• • • • • • • • • • • • • •	PLOT_NO ¥ 1 1	Silk_Date_ymd ¥ 20190513 (20190512) 20190510	Ant_Date_ymd 20190513 20190510	Access Show Categor GY_DW_kt 0.1213 (0.1 0.0559	pt Discard ical Description gPlot ¥ 09867)
	Select B TRIAL 1 2 3	Environment: All envir atch Actions	ronments ▼ Filter TTRY_TYPE ▼ GIU st entry 73 st entry 73 st entry 73	by status: All D T DESIGNATI HM11 HM11 HM11	• • • • • • • • • • • • • •	PLOT_NO ♥ 1 1 1	Silk, Date, ymd ¥ 20190513 (20190512) 20190510 20190513	Ant_Date_ymd 20190513 20190510 20190510 20190518	Y GY_DW_kt 0.1213 (0.1 0.0555	pp Discard ical Description iii gPlot Y 29987)
	Select B TRIAL 1 2 3 4	Environment: All envir atch Actions LINSTANCE Y EN Te Te Te Te Te	ronments ▼ Filter TTRY_TYPE ▼ GII st entry 73 st entry 73 st entry 73 st entry 73	by status: All D Y DESIGNATI HM11 HM11 HM11 HM11	• • • • • • • • • • • • • •	PLOT_NO ♥ 1 1 1 1	Silk, Date, ymd ¥ 20190513 (20190512) 20190510 20190513 20190513	Ant_Date_ymd 20190513 20190510 20190510 20190518 20190514	Y GY_DW_kt 0.1213 (0.1 0.0559 0.0655 0.0999	pp Discard ical Description iii gPlot Y 09967)
	Select B TRIAL 1 2 3 4 5	Environment: All environment: All environment: atch Actions	TRY_TYPE ¥ GII st entry 73 st entry 73 st entry 73 st entry 73 st entry 73 st entry 73	by status: All Y DESIGNATI HM11 HM11 HM11 HM11 HM11		PLOT_NO ♥ 1 1 1 1 1 1 1	Silk, Date, ymd ¥ 20190513 (20190512) 20190513 20190513 20190513 20190510	Ant_Date_ymd 20190513 20190510 20190510 20190518 20190514 20190511	 Acceleration Show Categor 0.1213 (0.1 0.0559 0.0655 0.0999 0.0361 	pt Discard tcal Description ## gPlot Y g9967)

Notice that entry 1 has two cells of data pending overwrite, Silk_Dat_ymd & GY_DW_kgPlot. The data to be overwritten is within parenthesese.

Review & Validate

If the value for a given trait variable exceeds the expected range defined in the ontology (see<u>Manage Ontology</u>), the BMS will flag these values in red. You are not able to save the data until the out-of-bounds values have been validated, corrected or accepted.

• Review out-of-bounds data from the Actions Menu under Data Collection Options.

BREEDING ACTIVITIES	K 🖪 MC PF	ROGRAM					Site Admin	My Prog	rams 🕜 ᆽ admin 👻
Manage Germplasm Manage Studies Manage Samples	MANAGE S	STUDIES	Save Disca	rd data			ERROR There are value, ple	e some measu ease correct the	rements that have invalid em before proceeding.
► INFORMATION MANAGEMENT	Settings Germpla	asm & Checks	Environments	Experimental Desig	n Measurements				Save Study
STATISTICAL ANALYSIS PROGRAM ADMINISTRATION	 Define Measur TRAITS @ 	ement Details			_		Export study	book	Design and planning options Crossing options Field map options Data collection options
	Name	Desc	cription			Input Variables	Export germ	olasm list	Advance study options >
	PH_M_cm	Plant	t height BY PH - Mea	surement IN cm			Review out-o	f-bounds data	Close study
	AleuCol_E_1to	Aleu	rone color BY AleuCo	ol - Estimation IN 1-5 /	leurone color scale				Delete study
	Select All	100 *	Showing 1 to 100 of	988 entries				Show Cate	gorical Description
	TRIAL_INSTANCE	ENTRY_TYPE	GID	DESIGNATION	ENTRY_NO	REP_NO	PLOT_NO	PH_M_cm	AleuCol_E_1to5
	1	т	12225	UGW16225	225	1	1	128	0
	1	т	12189	UGW16189	189	1	2	126	4
	1	т	12179	UGW16179	179	1	3	119	2
	1	Т	12074	UGW16074	74	1	4	121	9

Out-of-bounds values for the aleurone color scale (1-5) are highlighted red and are preventing the data from being saved.

- Choose how to proceed with out-of-bounds data.
 - Review Details
 - Accept all data as-is
 - Set all exceptions to missing
- Review details and select Next to navigate out-of-bound values and make individual decisions about them.

BREEDING ACTIVITIES	< 🖪 MC PROGR	RAM			Site Admin	My Programs	? 旲 admin 👻
Manage Germplasm	MANAGE STUD	DIES	Ø			_	
Manage Studies	👻 Design Types		Review out of bounds data		ж	Return to	Manage Studies
Manage Samples	BASIC DETAILS		Some of the data in your measurements table fall outside the	e valid values defined for th	he trait		Actions
► INFORMATION MANAGEMENT	Settings Germplasm & C	Checks E	variables.				
STATISTICAL ANALYSIS			Please choose how you would like to proceed:	Please Choose	*		
	 Define Measurement 	Details		Please Choose			
PROGRAM ADMINISTRATION	🖞 TRAITS 🔞		Cancel Next	Review details			
				Accept all data as-is			
	Name	Descrip	tion	Set all exceptions to mis	ssing		
	PH_M_cm	Plant he	ight BY PH - Measurement IN cm				
		Aleuron	e color BV AleuCol - Estimation IN 1-5 Aleurone color scale				

• Review the details of out-of-bounds data. Enter revised values, accept the out of range values, or set the data to

missing. Set all exceptions to missing will designate out-of-bounds as "missing". Finish.

BREEDING ACTIVITIES	< 🖪 MC PROGE	RAM				Si	te Admin	My Program	s 🕜 夬 ad	lmin 👻
Manage Germplasm	MANAGE STU	DIES Ø								
Manage Studies	👻 Design Types	Details out of l	bounds data for Aleu	Col_E_1t	05			n	h to Manage Studie	ts
Manage Samples	► BASIC DETAILS	Some of the entries i	n your measurements table	have values	for the AleuCol_E_1to	5 trait that are outsi	de the valid v	alues	Actions	
INFORMATION MANAGEMENT	Settings Germplasm &	Valid Values:	bie.							
STATISTICAL ANALYSIS	Define Measurement	LABEL	DESCRIPTION							
► PROGRAM ADMINISTRATION	NE TRAITE O	1	colorless							
	TRAITS 🐨	2	bronze							
	Name	3	red							
	D PH_M_cm	4	purple							
	AleuCol_E_1to5	5	other							
	Select All	100 * Showir	ng 1 to 3 of 3 entries							
	≜⊡ •••	1	LOCATION_NAME ENTRY	Y_NO	PLOT_NO	OLD VALUE	NEW VALU	E		
	Is Measurements		INT CROPS RES INST 225		1	0	1			
	Records per page: 100		INT CROPE DECINICT 74			0		ric	al Description	
	TRIAL_INSTANCE ENTR	•	INT CROPS RES INST 74		4	9			AleuCol_E_1to	5
	1 T		Please Choose	i.e.		8			0	
	1 T		Apply the same new value	e to selecte	d values			_	4	
	1 T		Set selected values to mi	ssing					2	
	1 I	Select All	Please Choose						9	
	1 T)				2	
	1 T			Cance	Finish				2	
	1 Т	12062	UGW16062	62	1	8		19	3	

Aleurone color (scale 1-5) has three out-of-bounds values. Plot number one was given a revised value of 1 and the other two plots are set to missing.

Accept data

• Select Accept to commit the pending data to the database.

BREEDING ACTIVITIES	< B	MC PROGRA	М				Site Admin	My Programs	? 👤 admin 🝷
Manage Germplasm	MAN	AGE STUDI	ES Ø						
Manage Studies	👻 Desi	gn Types	Save					Return to	Manage Studies
Manage Samples	BASI	C DETAILS							Actions
INFORMATION MANAGEMENT	Settings	Germplasm & Che	cks Environments	Experimental Design	Measurements				
STATISTICAL ANALYSIS	▼ Defir	e Measurement De	tails			Add			
PROGRAM ADMINISTRATION	🍟 TRAIT	'S 🕜							
		-							
	Nan	1e	Description			Input variables			
	□ PH_	M_cm	Plant height BY PH - Me	easurement IN cm					
	Aleu	Col_E_1to5	Aleurone color BY Aleu	Col - Estimation IN 1-5 Ale	urone color scale				
	Select	All Remove							
	nte Meas	urements							
	Coloct Em					100 -			
	Select Env	ironment.		E SEMI-ARID TROFIES	Records per page	e: Showing	g 1 to 100 of 494 ent	ries	
	ENTRY_T	YPE GID	DESIGNATIO	N ENTRY_NO	REP_NO	PLOT_NO	PH_M_c	m Ale	exercised Description
	Test entr	y 12225	UGW16225	225	1	1	128	1	
	Test entr	y 12189	UGW16189	189	1	2	126	4	
	Test entr	y 12179	UGW16179	179	1	3	119	2	
	Test entr	y 12074	UGW16074	74	1	4	121	mi	ssing
	Test entr	y 12125	UGW16125	125	1	5	128	4	
	Test entr	y 12229	UGW16229	229	1	6	122	2	

• Accepting data as-is will not change the out-of-bounds values. Accepted out-of-bounds values are highlighted a light blue color.

BREEDING ACTIVITIES	< 🖹 MC P	ROGRAM					Site Admin	My Programs	? 契 admin
Manage Germplasm Manage Studies Manage Samples	MANAGE S Design Typ Basic Detail	STUDIES es .s	Save Disc	card data				Return t	o Manage Studies Actions
	Settings Germp	lasm & Checks	Environments	Experimental Design	Measurements				
STATISTICAL ARALISIS	 Define Measu 	rement Detail	5						
PROGRAM ADMINISTRATION	🝟 TRAITS 🔞								
	Name	Des	cription			Input variables			
	PH_M_cm	Plan	it neight BY PH - Me	easurement IN cm					
	AleuCol_E_1to	5 Aleu	irone color BY Aleu	Col - Estimation IN 1-5 A	leurone color scale				
	Select All								
	1 Measurement	ts							
	Records per page	. 100 *	Showing 1 to 100 c	of 988 entries				Show Categorical	Description III
	TRIAL_INSTANCE	ENTRY_TYPE	GID	DESIGNATION	ENTRY_NO	REP_NO	PLOT_NO	PH_M_cm	AleuCol_E_1to5
	1	т	12225	UGW16225	225	1	1	128	0
	1	т	12189	UGW16189	189	1	2	126	4
	1	т	12179	UGW16179	179	1	3	119	2
	1	т	12074	UGW16074	74	1	4	121	9
	1	т	12125	UGW16125	125	1	5	128	4
	1	т	12229	UGW16229	229	1	6	122	2
	1	т	12109	LICM/16109	109	1	7	130	2

Inline Validation

• Perform inline decisions with out of bound data by editing a given cell. Either enter new value or right click to accept or exclude.

BREEDING ACTIVITIES	< 🖪	MC PROGRAI	M				Site Admin	My Programs	? 👤 admin
Manage Germplasm Manage Samples	□ Aleu	Col_E_1to5	Aleurone color	BY AleuCol - Estima	ation IN 1-5 Aleu	urone color sca	le		
Manage Studies	Select	All							
▼ INFORMATION MANAGEMENT	🔃 Meas	urements							
Import Germplasm	Records	per page: 100	Showing 1	to 100 of 988 entri	es			Show Categorical D	escription
Manage Genotyping Data	TRIAL_IN	ISTANC ENTRY_TYPE	GID	DESIGNATION	ENTRY_NO	REP_NO	PLOT_NO	PH_M_cm	AleuCol_E_1to5
Browse Studies	1	Т	12225	UGW16225	225	1	1	128	1
Head to Head Query	1	т	12189	UGW16189	189	1	2	126	4
Manage Ontologies	1	Т	12179	UGW16179	179	1	3	119	2
Import Datasets	1	т	12074	UGW16074	74	1	4	121 Accept	Value
Trait Donor Query	1	Т	12125	UGW16125	125	1	5	128 Mark N	lissing
► STATISTICAL ANALYSIS	1	т	12229	UGW16229	229	1	6	122	4
PROGRAM ADMINISTRATION	1	Т	12108	UGW16108	108	1	7	130	2
	1	Т	12062	UGW16062	62	1	8	119	2
	1	Т	12157	UGW16157	157	1	9	122	2
	1	Т	12127	UGW16127	127	1	10	120	2
BMS 9.3	1	T	12173	UGW16173	173	1	11	126	2

Data Staging

When you import sub-observation data, these data are staged in pending view.

Pending

Pending data is NOT available in the database for queries and analysis. Pending data must be either accepted for long-term storage or discarded. The filtering and batch action functionalities are still under development. Expect improvements

in upcoming versions.

• Import observations. Select Accept or Discard.

	A VIVA								Site	Admin	My Programs	? sh
ANAGE S	STUDIES mance Trial	0	ave								Return to f	Manage Studie
 BASIC DETAIL 	.S											Actions
tings Germp	lasm & Checks	Freatment Facto	rs Environment	ts Experime	ental Design	Observations	Plants: 19					
Plants: 19												
_												
Define Obse	ervation Details											_
Dbservatio	ons										ACCEPTED PI	ENDING
											Accept	Discard
Select Environm	nent: All environ	ments 🔻 Filt	er by status: 🔽	dl						9	Show Categorical Des	cription
			C)ut of bounds 'o be overwritten								
 Batch Act 	ions											
TRIAL_INSTAN		PE 🔶 GID 🔶	DESIGNATION	ENTRY_NO	PLOT_NO	BLOCK_NO	PLANT_NO	PintHt_cm ▼	NodWt_Frsh_g ▼	NPSEL 🔻	AphDam_Est_0to	04 ▼
1	Test entry	1000130	DF32	42	1	1	1	63	153		2	
1	Test entry	1000130	DF32	42	1	1	2	98	216	1	0	
											0	
1	Test entry	1000130	DF32	42	1	1	3	78	109		1	
1	Test entry Test entry	1000130 1000130	DF32 DF32	42 42	1	1	3	78 71	109 107		0	
1 1 2	Test entry Test entry Test entry	1000130 1000130 1000157	DF32 DF32 DF59	42 42 69	1 1 1	1 1 1	3 4 1	78 71 73	109 107 252	•	0 1 0 0	

• If the pending data contains values that fall outside of the min/max range defined by the ontology, choose to accept the data as is or to set all exceptions to "missing". If accepted as-is, you have the opportunity later to review and edit these values. Proceed to accept the data.

BREEDING ACTIVITIES	< 🔁 VIGNA VIV	/A						Site Admin	My Programs	? 👤 Shawn 🔹
Manage Germplasm	MANAGE STU	DIES 0								
Manage Studies	👻 v12 Performanc	ce Trial	Accept p	ending data				×	Return t	o Manage Studies
Manage Samples	BASIC DETAILS		Some of the	data in you observ	ation table fall o	utside the valid va	alues defined for	he		Actions
► INFORMATION MANAGEMENT	Settings Germplasm &	Checks Treat	Please choo	ose how you would	l like to	 Accept all data Set all exception 	a as-is			
STATISTICAL ANALYSIS	# Plants: 10		proceeu.			Jet all excepti	ona to misaing			
► PROGRAM ADMINISTRATION					Cancel	Proceed				
	19		_	_	_		_	_		
	Define Observation	on Details								
	0bservations								ACCEPTED	PENDING
									Accept	Discard
	Select Environment:	All environments	* Filter	by status: All	•				Show Categorical D	escription
	Batch Actions									
			≜ GID ≜	DESIGNATION						a 🔻
	1	Test entry			42	1	1	1	15.3 (153)	5 '
	1	Test entry	1000130	DE32	42	1	1	2	21.6 (216)	
	1	Test entry	1000130	DF32	42	1	1	3	10.9 (109)	
	1	Test entry	1000130	DF32	42	1	1	4	10.7 (107)	
	2	Test entry	1000157	DF59	69	1	1	1	25.2 (252)	

Accepted

Accepted data is in long-term database storage and available for QC as well as queries and analysis. The filtering and batch action functionalities are still under development. Expect improvements in upcoming versions.

	A VIVA								Site Admin	My Programs	?
NAGE S	STUDIES	5 @ N	Save							Return	to Manage
BASIC DETAIL	S										∿∎ 🔽
ngs Germpl	asm & Checks	Treatment Fac	ors Environm	ents Experim	iental Design	Observations	Plants: 19				
Plants: 19											
Define Obse	ervation Detai	ils									
										ACCEPTED	PENDING
	7115										
Select Environm	ient: 1 - Int I	Institute of Tropical	Agriculture *	Filter by status:	Out of bound	S				Show Categorical	Description
 Batch Acti 	ons				Out of sync						
 Batch Acti 	ons				Out of sync						ш
Batch Acti ENTRY_TYPE	ons	DESIGNATION	ENTRY_NO	PLOT_NO	Out of sync	PLANT_NO	PintHt_cm T	NodWt_Frsh_g Ŧ	AphDam_Est_0	to4 🔻 NP	III PSEL ₹
Batch Acti ENTRY_TYPE Test entry	GID \$ 1000130	DESIGNATION DF32	ENTRY_NO 42	PLOT_NO 1	Out of sync BLOCK_NO	PLANT_NO	PIntHt_cm T 63	NodWt_Frsh_g ▼ 153	AphDam_Est_0	to4 Ŧ NP	III PSEL ₹
Batch Acti Batch Acti ENTRY_TYPE Test entry Test entry	GID ¢ 1000130 1000130	DESIGNATION DF32 DF32	 ENTRY_NO 42 42 	PLOT_NO 1 1	BLOCK_NO 1 1	PLANT_NO 1 2	 ▶ PIntHt_cm ▼ 63 98 	NodWt_Frsh_g ▼ 153 216	AphDam_Est_0 2 0	to4 〒 NP 1	III PSEL Ŧ
Batch Acti ENTRY_TYPE Test entry Test entry Test entry	GID GID <thgid< th=""> <thgid< th=""> <thgid< th=""></thgid<></thgid<></thgid<>	DESIGNATION DF32 DF32 DF32	 ENTRY_NO 42 42 42 42 	PLOT_NO 1 </td <td>BLOCK_NO 1 1 1 1</td> <td>PLANT_NO 1 2 3</td> <td> PIntHt_cm Y 63 98 78 </td> <td>NodWt_Frsh_g ▼ 153 216 109</td> <td>AphDam_Est_0 2 0</td> <td>to4 ▼ NP 1</td> <td>III PSEL ₹</td>	BLOCK_NO 1 1 1 1	PLANT_NO 1 2 3	 PIntHt_cm Y 63 98 78 	NodWt_Frsh_g ▼ 153 216 109	AphDam_Est_0 2 0	to4 ▼ NP 1	III PSEL ₹
Batch Acti ENTRY_TYPE Test entry Test entry Test entry Test entry Test entry	GID GID 1000130 1000130 1000130 1000130 1000130 1000130	DESIGNATION DF32 DF32 DF32 DF32	 ENTRY_NO 42 42 42 42 42 42 	PLOT_NO 1 1 1 1 1 1 1 1 1 1 1 1 1	BLOCK_NO 1 1 1 1 1 1	PLANT_NO 1 2 3 4	 PIntHt_cm ▼ 63 98 78 71 	NodWt_Frsh_g ¥ 153 216 109 107	AphDam_Est_0 2 0 1 0	to4 ▼ NP 1	III PSEL ₹
Batch Acti ENTRY_TYPE Test entry Test entry Test entry Test entry Check entry	GID GID <thgid< th=""> <thgid< th=""> <thgid< th=""></thgid<></thgid<></thgid<>	DESIGNATION DF32 DF32 DF32 DF32 DF32 BMS-6	 ENTRY_NO 42 42 42 42 42 8 	PLOT_NO 1 1 1 1 1 2	Missing Out of sync BLOCK_NO 1 1 1 1 1 1 1 1 1	PLANT_NO 1 2 3 4 1	 PintHt_cm Y 63 98 78 71 59 	NodWt_Frsh_g 7 153 216 109 107 265	AphDam_Est_0 2 0 1 0 2	to4 🔻 NP	III PSEL Ŧ
Batch Active Batch Active ENTRY_TYPE Test entry Test entry Test entry Check entry Check entry Check entry	GID GID 1000130 1000130 1000130 1000130 1000130 100077 1000077 100077	DESIGNATION DF32 DF32 DF32 DF32 BMS-6 BMS-6	 ENTRY_NO 42 42 42 42 8 8 	 PLOT_NO 1 1 1 2 2 	BLOCK_NO BLOCK_NO	PLANT_NO 1 2 3 4 1 2	 PIntHt_cm Y 63 98 78 71 59 58 	NodWt_Frsh_g 7 153 216 109 107 265 152	AphDam_Est_0 2 0 1 0 2 3	to4 Ŧ NP	₩ PSEL Ŧ
Batch Acti ENTRY_TYPE Test entry Test entry Test entry Test entry Check entry Check entry Check entry	GID GID <thgid< th=""> <thgid< th=""> <thgid< th=""></thgid<></thgid<></thgid<>	DESIGNATION DF32 DF32 DF32 DF32 BMS-6 BMS-6 BMS-6	 ENTRY_NO 42 42 42 42 8 8 8 	 PLOT_NO 1 1 1 2 2 2 	BLOCK_NO BLOCK_NO BLOCK_NO	PLANT_NO 1 2 3 4 1 2 3 3 3	 PIntHt_cm ▼ 63 98 78 71 59 58 91 	NodWt_Frsh_g ¥ 153 216 109 107 265 152 159	AphDam_Est_0 2 0 1 0 2 2 3 4	to4 Ŧ NP	₩ PSEL Ŧ
Batch Acti ENTRY_TYPE Test entry Test entry Test entry Check Ch	IDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD	DESIGNATION DF32 DF32 DF32 DF32 BMS-6 BMS-6 BMS-6 BMS-6	 ENTRY_NO 42 42 42 8 8 8 8 	 PLOT_NO 1 1 1 2 2 2 2 2 	BLOCK_NO BLOCK_NO	 PLANT_NO 1 2 3 4 1 2 3 4 4 4 4 4 	 PIntHt_cm ▼ 63 98 78 71 59 58 91 63 	NodWt_Frsh_g ▼ 153 216 109 107 265 152 169 169 195	AphDam_Est_0 2 0 1 0 2 2 3 4 3	to4 Ŧ NP	III PSEL Ŧ

Data for 3 traits (plant height, nodule weight, and aphid damage score) and number of plants selected have been accepted into the database.

-

Import Data After Acceptance

Once data has been accepted it can be overwritten or additional data added via data import. In the following example, a breeder has accepted data, but notices an error in the measurement of nodule fresh weight in the originating spreadsheet. She is able to correct the spreadsheet and import the file again.

• Review the pending data. Select Accept or Discard.

BREEDING ACTIVITIES	K 🖪 VIGNA VIV	VA						Site Admin	My Programs	? 契 Sha
Manage Germplasm	👻 v12 Performan	ce Trial	Sav	e					Return to	o Manage Studies
Manage Studies	BASIC DETAILS			-						Actions
Manage Samples										
INFORMATION MANAGEMENT	Settings Germplasm 8	checks Treatn	ient Factors	Environments	Experimental D	esign Obse	rvations Pla	ints: 19		
STATISTICAL ANALYSIS	# Plants: 19									
PROGRAM ADMINISTRATION	19									
	Define Observation	on Details								
	Deservations								ACCEPTED	PENDING
									Accent	Discord
	Select Environment:	All environments	• Filter	by status: All	•				Show Categorical D	escription
	Select Environment:	All environments	• Filter	by status: All	•				Show Categorical D	escription
	Select Environment:	All environments	• Filter	by status: All	•				Show Categorical D	escription
	Select Environment: Batch Actions TRIAL_INSTANCE	All environments	 Filter GID 	by status: All DESIGNATION	ENTRY_NO	PLOT_NO	BLOCK_NO	PLANT_NO	Show Categorical D	escription III g T
	Select Environment: Batch Actions TRIAL_INSTANCE 1	All environments ENTRY_TYPE Test entry	 Filter GID + 1000130 	by status: All DESIGNATION DF32	ENTRY_NO 42	PLOT_NO	BLOCK_NO	PLANT_NO 1	Show Categorical D NodWt_Frsh_ 15.3 (153)	g T
	Select Environment: Batch Actions TRIAL_INSTANCE 1 1	All environments ENTRY_TYPE Test entry Test entry	 Filter GID 1000130 1000130 	DESIGNATION DF32 DF32	• ENTRY_NO 4 42 42	PLOT_NO 1 1	BLOCK_NO	PLANT_NO 1 2	Show Categorical D Image: state	sescription III g ▼
	Select Environment:	All environments ENTRY_TYPE Test entry Test entry Test entry Test entry	 Filter GID 1000130 1000130 1000130 	DESIGNATION DF32 DF32 DF32	 ENTRY_NO 42 42 42 42 42 	PLOT_NO 1 1 1 1 1	BLOCK_NO 1 1 1 1 1	PLANT_NO 1 2 3	Show Categorical D Image: state	escription III g T
	Select Environment: Batch Actions TRIAL_INSTANCE 1 1 1 1 1	All environments ENTRY_TYPE Test entry	 Filter GID 1000130 1000130 1000130 1000130 	DF32 DF32 DF32 DF32	• • • •	PLOT_NO 1 1 1 1 1 1 1 1	BLOCK_NO 1 1 1 1 1 1 1	PLANT_NO 1 2 3 4	Show Categorical D * NodWt_Frsh 15.3 (153) 1.6 (216) 10.9 (109) 10.7 (107)	g T
	Select Environment: Batch Actions TRIAL_INSTANCE 1 1 1 2	All environments All environments ENTRY_TYPE Test entry	 Filter GID 1000130 1000130 1000130 1000130 1000130 	DESIGNATION DF32 DF32 DF32 DF32 DF32 DF32 DF59	ENTRY_NO 42 42 42 42 69	PLOT_NO 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	BLOCK_NO 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PLANT_NO 1 2 3 4 1	Show Categorical D • NodWt_Frsh_ 15.3 (153) 21.6 (216) 10.9 (109) 10.7 (107) 25.2 (252)	g T
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The BMS only displays new data in pending view. Although the file uploaded also contained plant height and selections, these data are not shown in pending view because they match the already accepted data. Only nodule fresh weight needs to be reviewed in pending view. Notice that the first nodule fresh weight measurement of 153g will be replaced with 15.3g once if the pending data is accepted.