Crops, Descriptors, & Observations

NordGen Webinar Series Session 1 - Dec. 5, 2023

Marty Reisinger, Instructor

Sessions

Session	Торіс	Lecture/Demo	QA
1	Introduction / Overview	05 Dec. 2023	12 Dec. 2023
2	Creating Ancillary (Related) Records and Standards	10 Jan. 2024	17 Jan. 2024
3	NordGen's Crop Methods and Projects Mapping	24 Jan. 2024	31 Jan. 2024
4	GG requirements for Establishing Crops, Traits, and Coded Values in GG	06 Mar. 2024	13 Mar. 2024
5	How GG crop tables interrelate	20 Mar. 2024	27 Mar. 2024
6	Recording Observation records in GG	17 Apr. 2024	24 Apr. 2024
7	Using GG's features to search on and report on the data	01 May. 2024	08 May. 2024
8	Review of Crops and Descriptors	15 May. 2024	

Today

Agenda

Introduction / Overview – Session 1

Review

GG traits and observations at a high level

how the Public Website is used to display and search accessions using existing observations

- GG terminology
- Know what data should be recorded under *Crop* Descriptors versus *Source Habitat* descriptors
- Public Website & Curator Tool Examples
- GG hierarchy of Crop- related tables

Method

- Crop
- Crop Mapping Taxonomy Species Map
- Trait

• Code

- Language table: Trait Language and Code Language
- Attachments tables: Crop, Trait

GG Terminology

What is a Method?

Method

Method Example

APPLE.MORPHOLOGIC.91

Evaluation location: New York, United States

Study Name: Malus.morphologic.91 Experiment Type: Field field Study Year: 1990 Exp. Location: E1 S1 T1 O24 Latitude: 42 Degrees 52 Minutes N Longitude: 76 Degrees 59 Minutes W Elevation: 161 meters Hardiness Zone: 6A Zone source: USDA Topography: flat Soil class: Ontario Soil texture: Gravelly Loam Min photoperiod: 11 Max photoperiod: 16 Min temperature: -2 Max temperature: 35 Avg temperature: 16 Solar radiation: 422 (gm cal/cm2) Water type: RF Total rainfall: 1155 Mean daily rainfall: 3 mm/day Irrigation type: rain Fertilizer type: N Year started: 04/10/1990 Year planted: 05/15/1985 Year ended: 10/31/1991 Experiment length: 2 years Publication flag: N

Method Example

SORGHUM.BRIX.ISABELA.2016

A total of 756 and 760 accessions were evaluated for sugar content (i.e. Brix) in 2015 and 2016, respectively. Each year these accessions were grown in a completely randomized block design with plots measuring 1.8 m in length with 0.9 m between rows. When the plot reached its physiological maturity (30-45 days after flowering), three to five plants per plot (leaf and stalk)

with plots measuring 1.8 m in length with 0.9 m between rows. When the plot reached its physiological maturity (30-45 days after flowering), three to five plants per plot (leaf and stalk) were pressed with a three-roller sugarcane mill (Raja-1 US Ice Machine Manufacturing Co. FL, U to collect the total juice. The Brix of the total juice was measured using a handle refractometer (Atago U.S.A. Inc., Bellevue, WA).

Converted lines developed in the Sorghum Conversion Program conducted cooperatively by USDA/ARS at Mayaguez, Puerto Rico and the Texas Agricultural Experiment Station.

Resistance of sorahum converted lines to Anthrachose Rust Ladder Spot and Zonate Leaf Spot

Method Example

Hummer et al. Strawberry Evaluation 2019

In September 2018, 288 cultivars were planted in a field on the North Farm of the USDA, 33707 Peoria Road, Corvallis, Oregon, 97333-2521. For this field study, three replicates of each cultivar were planted in a randomized complete block design (RCBD). The blocks are defined based on irrigation proximity and soil compaction. Guard rows of strawberries were planted around the perimeters of the plot and central water wheel row.

Plant spacing is $0.762m (2.5') \ge 0.762m (2.5')$ so that the plants can be tilled across rows and within rows using existing tractors and tillers. This prevents runners from contaminating adjacent clones. Irrigation is provided by a center waterwheel that travels the length of the plot.

Traits evaluated in spring-summer 2019: Plant Height measured early May First Flower Date taken weekly from 1 March through Mid-June Average number of runners per crown collected during the week of 1 July

In GG, when you record each observation record, you indicate the method that was followed

Method

ummer et al. Strawberry Evaluation 2019

Order Request	Web Order Request V	Veb Order Request	Item Web Order R	equest Action	Crop Trait C)bservation	Crop Trait Lang	Crop Trait	Method 🍃 💶		
cession	Inventory	Сгор	Crop Trait 🔺	Coded Value	nmer et	al.Stra	awberry E	Evaluati	on 2019		
64338	CFRA 1875 .001 PL	STRAWBERRY	Fruit harvest date		nmer et	al Stra	wher F	- Valuati	on 2019		
66638	CFRA 2156 .001 PL	STRAWBERRY	Fruit harvest date	- Ci	inter et	ar.out	rawberry Evaluation 2019				
16781	CFRA 1499 .001 PL	STRAWBERRY	Fruit harvest date		nmer et	al Stra	whom P	Evaluati	on 2019		
51951	CFRA 660 .001 PL	STRAWBERRY	PLANT_HEIGHT	u	inner et	ar.out	which is a second secon	valuau	0112013		
51050	CERA 1246 001 PI	STRAWBERRY	PLANT USIGUT			1.0		- 1 e	2010		

Studies or environments

• <u>S9.CANTALOUPE</u>

GG Public Website images

1224 Accessions

S9.CANTALOUPE

Evaluation location: Georgia, United States

Comment: The data in this study was recorded by the staff of the Southern Regiona Introduction Station in Griffin, Georgia. For additional information, contact Kathy Re 294-3212.

Trait(s) evaluated	
ANTHRAC	128 Accessions
BACTWILT	794 Accessions
DOWNMILDEW	354 Accessions
FLESHCOLOR	1362 Accessions
FLESHTASTE	1224 Accessions
FLESHTHICK	1364 Accessions
FRUITCOLOR	1392 Accessions
FRUITDIAM	1450 Accessions
FRUITLEN	1451 Accessions
FRUITSHAPE	1507 Accessions
FRUITSURF	1477 Accessions

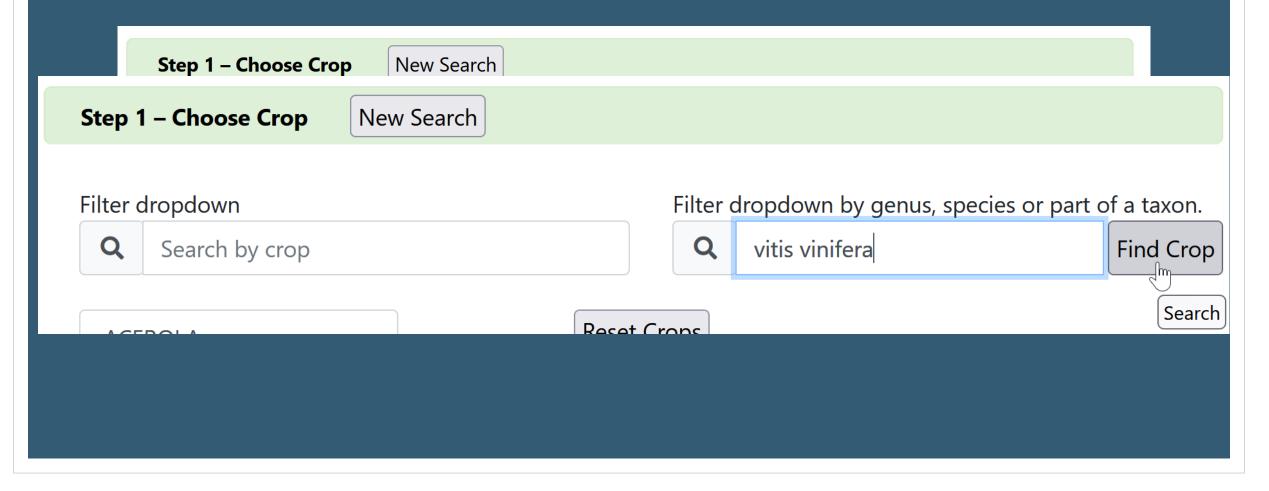


What is a "crop"?

a set of species determined by the curator

Crop as defined in GG

Can a species be in more than one crop?



Example

GRAPE-DAVIS

Species

- Ampelopsis spp.
- Ampelopsis delavayana Planch. var. delavayana
- Ampelopsis delavayana Planch. var. glabra (Diels & Gilg) C. L. Li
- Ampelopsis glandulosa (Wall.) Momiy. var. brevipedunculata (Maxim.) Momiy.

 \mathbb{A}

- Ampelopsis vitifolia Planch.
- Parthenocissus quinquefolia (L.) Planch.
- Vitis hybr.
- Vitis spp.
- Vitis ×andersonii Rehder
- · Vitic y hourquiniana M. A. Toulor
- vuis rupestris scheele
- Vitis shuttleworthii House
- Vitis tiliifolia Humb. & Bonpl. ex Willd.
- Vitis treleasei Munson ex L. H. Bailey
- Vitis vinifera L.
- Vitto vingera L. subsp. syrvestric Hegi
- Vitis vinifera L. subsp. vinifera
- Vitic vulpina L.

GRAPE-GENEVA

Species

- Ampelopsis cordata Michx.
- Ampelopsis glandulosa (Wall.) Momiy. var. brevipedunculata (Maxim.) Momiy.
- Parthenocissus spp.
- Vitis hybr.
- Vitis spp.
- Vitis ×andersonii Rehder
- Vitis x champinii Planch
- Vitis palmata Vahl
- Vitis piasezkii Maxim. var. pagnuccii (Rom. Caill. ex Planch.) Rehder
- Vitis piasezkii Maxim. var. piasezkii Maxim.
- Vitis popenoei J. H. Fennel
- Vitis riparia Michx.
- Vitis romanetii Rom. Caill.
- Vitis rupestris Scheele
- Vitis vinifera L. subsp. vinifera
 - Vitis vulpina L

Example

COTTON-PRE2006

- Species
 - Gossypium spp.
 - Gossypium australe F. Muell.
 - Gossypium barbadense L.
 - Gossypium hirsutum L.
 - Gossypium thurberi Tod.

DTTON	
	1

Species

- Gossypium hybr.
- Gossypium spp.
- Gossypium anapoides J. M. Stewart et al.
- Gossypium anomalum Wawra
- Gossypium anomalum Wawra subsp. anomalum
- Gossypium anomalum Wawra subsp. senarense (Fenzl ex Wawra) Vollesen
- Gossypium arboreum L.
- Gossypium areysianum Deflers
- Gossypium aridum (Rose & Standl.) Skovst.
- Gossypium armourianum Kearney
- Gossypium australe F. Muell.
- Gossypium barbadense L.
- Gossypium benedianse Mattei
- Gossyptum harknessii Brandegee
- Gossypium herbaceum L.
- Gossypium herbaceum L. var. africanum (G. Watt) J. B. Hutch. ex S. C. Harland
- Gossypium hirsutum L.
- Gossypium incanum (O. Schwartz) Hillc.
 - Construction Andrew

• In GG, a map table is used to associate multiple items from one table to items in another table

• Taxonomy Species

Search	Criteria											
@taxon	omy_crop_map.taxon	nomy_species_id IN (17	903)									
Search Results												
Ad	Add To Query Clear Query											
Order I	Request Action Ord	er Request Item Orde	r Request	Crop Trait Cr	op Trait Observatior	Taxonomy	Species	Web Order Requ	lest			
		Gossypium australe										
	Taxonomy Crop Map ID	Taxon	ixon				Alternate Crop Name		Con Nar			
	24492	Gossypium australe			COTTON-PRE200)6	N/A					
	25870	Gossypium australe			COTTON		N/A					

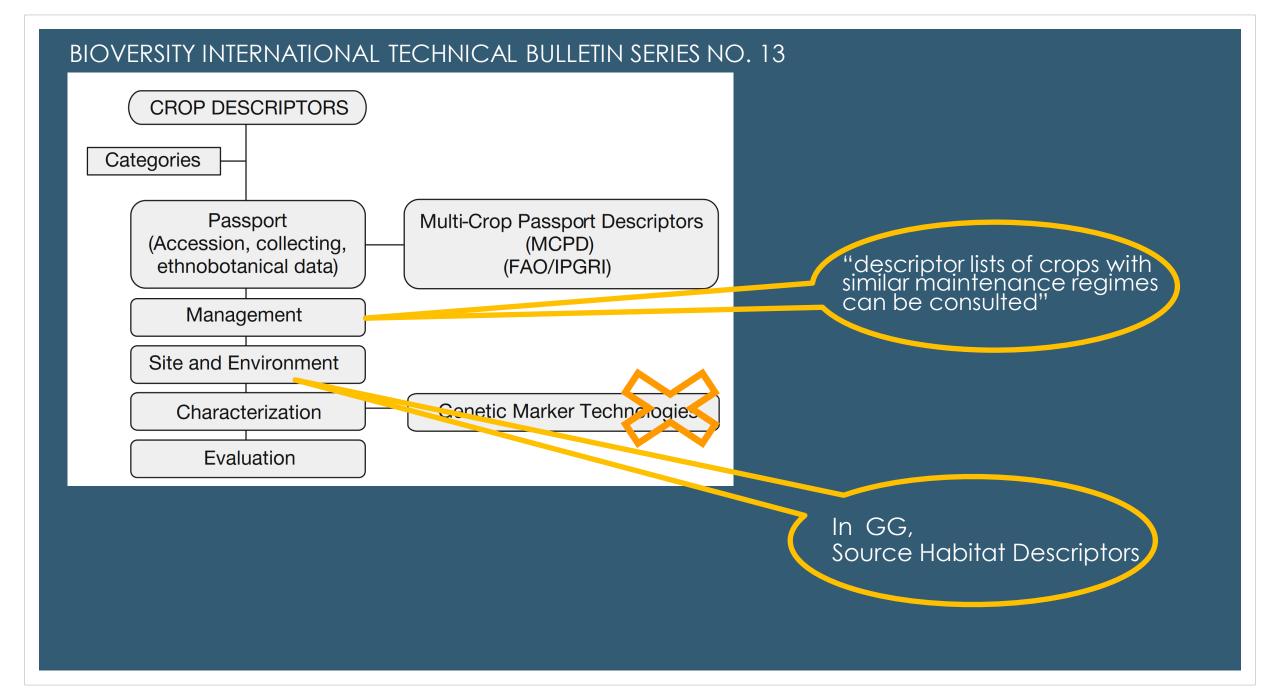
Map

A *descriptor* is defined as an attribute, characteristic or measurable trait that is observed in an accession ...

It is used to facilitate data classification, storage, retrieval, exchange and use

Descriptor as defined in

"bulletin13.pdf" (references)





plant or seed management descriptors



multiplication or regeneration descriptors

Management Descriptors

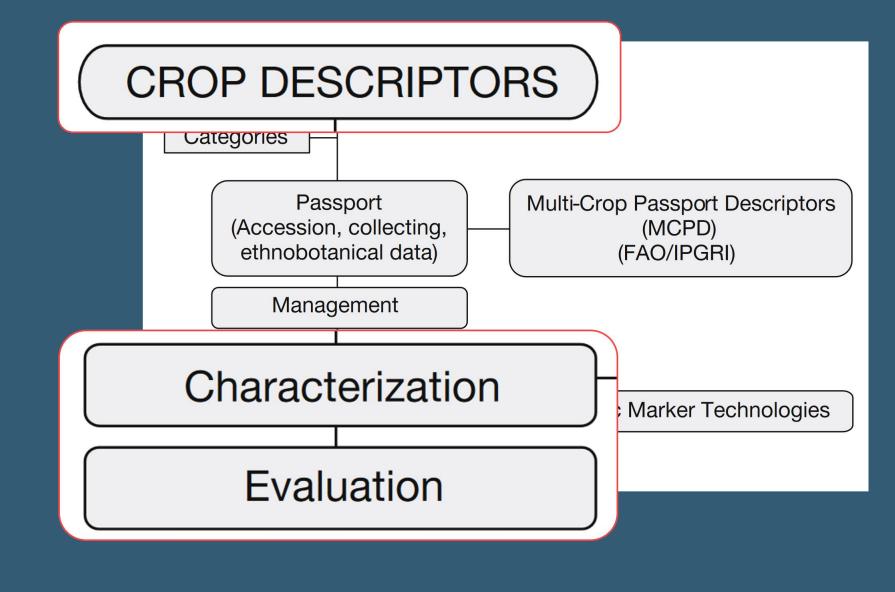
In GG,

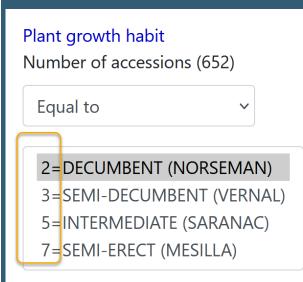
Inventory and Inventory viability data

GG is not the best place to store the raw genetic marker data

Genetic Markers

BIOVERSITY INTERNATIONAL TECHNICAL BULLETIN SERIES NO. 13





Codes for Traits

Alfalfa – Plant growth

USDA

Plant growth habit Number of accessions	(652)								_	odes for aits	
Equal to 2=DECUMBENT (NC 3=SEMI-DECUMBEN 5=INTERMEDIATE (S 7=SEMI-ERECT (MES) rsem It (Vei Saran	RNAL)				ſ	Trait			Alfalfa – Pla grov USI	•••••
	Accession Quarantine						Code				
	Acce	ession Quarantine	Accession Inven	tory Name Web Order I	Request Item Crop 1	Trait Code Lang Cr	Code				_
	Acce	Crop Trait Code ID	Crop	tory Name Web Order I Trait Name	Request Item Crop T Crop Trait	Trait Code Lang Cr Trait Description	2	Code Title	_	Code Description	
	Acce	Crop Trait				Trait Description Plant growth habit evaluated during th		Code Title	NORSEMAN)	Code Description DECUMBENT (NORSEMAN)	
		Crop Trait Code ID	Сгор	Trait Name	Crop Trait	Trait Description Plant growth habit evaluated during th mid stage of the se					8
		Crop Trait Code ID 1187	Crop ALFALFA	Trait Name GROWTH HABIT	Crop Trait Plant growth habit	Trait Description Plant growth habit evaluated during th mid stage of the se Plant growth habit Plant growth habit	2 3	DECUMBENT (ENT (VERNAL)	DECUMBENT (NORSEMAN)	8
		Crop Trait Code ID 1187 1188	Crop ALFALFA ALFALFA	Trait Name GROWTH HABIT GROWTH HABIT	Crop Trait Plant growth habit Plant growth habit	Trait Description Plant growth habit evaluated during th mid stage of the se Plant growth habit Plant growth habit	2	DECUMBENT (SEMI-DECUMB	ENT (VERNAL) E (SARANAC)	DECUMBENT (NORSEMAN) SEMI-DECUMBENT (VERNAL)	_
		Crop Trait Code ID 1187 1188 1189	Crop ALFALFA ALFALFA ALFALFA	GROWTH HABIT GROWTH HABIT GROWTH HABIT GROWTH HABIT	Crop Trait Plant growth habit Plant growth habit Plant growth habit	Trait Description Plant growth habit evaluated during th mid stage of the se Plant growth habit Plant growth habit Plant growth habit	2 3 5	DECUMBENT (SEMI-DECUMB INTERMEDIAT	ENT (VERNAL) E (SARANAC) IESILLA)	DECUMBENT (NORSEMAN) SEMI-DECUMBENT (VERNAL) INTERMEDIATE (SARANAC)	8 8 8
		Crop Trait Code ID 1187 1188 1189 1190	Crop ALFALFA ALFALFA ALFALFA ALFALFA ALFALFA	Trait Name GROWTH HABIT GROWTH HABIT GROWTH HABIT GROWTH HABIT	Crop Trait Plant growth habit Plant growth habit Plant growth habit Plant growth habit	Trait Description Plant growth habit evaluated during th mid stage of the se Plant growth habit Plant growth habit Plant growth habit	2 3	DECUMBENT (SEMI-DECUMB INTERMEDIATI SEMI-ERECT (N	ENT (VERNAL) E (SARANAC) IESILLA)	DECUMBENT (NORSEMAN) SEMI-DECUMBENT (VERNAL) INTERMEDIATE (SARANAC) SEMI-ERECT (MESILLA)	8
		Crop Trait Code ID 1187 1188 1189 1190 1191	Crop ALFALFA ALFALFA ALFALFA ALFALFA ALFALFA ALFALFA	Trait Name GROWTH HABIT GROWTH HABIT GROWTH HABIT GROWTH HABIT GROWTH HABIT GROWTH HABIT	Crop Trait Plant growth habit Plant growth habit Plant growth habit Plant growth habit Plant growth habit	Trait Description Plant growth habit evaluated during th mid stage of the se Plant growth habit Plant growth habit Plant growth habit Plant growth habit	2 3 5	DECUMBENT (SEMI-DECUMB INTERMEDIATI SEMI-ERECT (N ERECT (CUF 10	ENT (VERNAL) E (SARANAC) IESILLA)	DECUMBENT (NORSEMAN) SEMI-DECUMBENT (VERNAL) INTERMEDIATE (SARANAC) SEMI-ERECT (MESILLA) ERECT (CUF 101)	8 8 8

Language Tables

Crop Trait Language and Crop Trait Code Language

Searc	h Results									
A	dd To Query	Clear Query	-						Limit: 10000 🜩 Page Size: 1000 🜩	
Acce	ssion Quarantine	Accession Inventory Name We	b Order Request Item	Crop	Trait Code Lang				• •	
		alfalfa	Plant growth habit			1				
	Crop Trait Code Lang ID	Сгор	Crop Trait	Tra	ait Name	Code Definition	Trait T	îtle	Trait Description	
•	1187	ALFALFA	Plant growth habit	GR	OWTH HABIT	DECUMBENT (NORSEMAN)	Plant o	rowth habit	Plant growth habit evaluated during the mid stage	
	1188	ALFALFA	Plant growth habit	G			_			
	1189	ALFALFA	Plant growth habit	G						
	1190	ALFALFA	Plant growth habit	G	Trait 7	Title	Trait Des		cription	
	1191	ALFALFA	Plant growth habit	G						
	1192	ALFALFA	Plant growth habit	G	_					
				Plant g	growth habit			with habit evaluated during the mid stage		
					Plant o	rowth habit		Plant grov	wth habit evaluated during the mid stage	

Language records provide titles and descriptions

Images and other file types

– linked to GG records

Attachments

Source Habitat Descriptors

	Results d To Query	Clear Query					Limit:	10000 🔶 Pag	e Size: 100
Access	sion Source Coopera	tor Accession Quara	ntine Accession I	nventory Name Web Order Request Item	Crop Trait Code Lang	Crop Trait Code	Method Attach Crop	p Attach Source D	escriptor
	•								
	Source Descriptor ID	Descriptor	*	Category	Data Type	Is Coded?	C D-		Numeric Maximum
	30	SLOPE		Abiotic landform characteristics	Numeric descriptor	N h	Source Descripto		
	28	SLOPE FORM		Abiotic soil characteristics	Alpha/numeric des	Y			
	22	SOIL MOISTURE		Abiotic soil characteristics	Alpha/numeric des	Y			
	21	SOILpH		Abiotic soil characteristics	Alpha/numeric des	Y			
	23	SOIL TEXTURE		Abiotic soil characteristics	Alpha/numeric des	Y			

W6 57609

Source History

Collected

19 June 2018.

Cádiz Province, Andalucía, Spain Locality: Villaluenga del Rosario. Road A-374 Villaluenga del Rosario/Grazalema, between Las Covezuelas recreational area and road.

Coordinates: 54.9000, 55.1200 (Map it)

Elevation: 841m.

Georeference protocol: Lat/lon determined by GPS **Habitat:** Wild Habitat

Environment description: Roadside next to holm oak forest.

Number of plants sampled: 75

Associated species: Associated with: Lathyrus setifolius, Quercus rotundifolia, Vicia sativa.

Aspect: ; Slope: 22; Sample Area: 4. > 100 <= 500 Sq M; Soil Ph: Alkaline; Modifying Factors: ; Population Size: >50 <100; Sample Coverage: 100%

Comment: Only fruits and fruits already dispersed. Collectors: C. Andrés, F.J. Berrio and T. Marcos.

Collector(s):

• Dempewolf, Hannes, Global Crop Diversity Trust

Public Website & Curator Tool examples

For better or worse

Demo

Peanuts - crop page Cotton – Growth habit selecting the descriptor selecting the descriptor by code values Apple – crop page crop trait attachments Phaseolus – image 1 Brassica Methods in CT

Crop Example: PEANUTS

GRIN-Global	U.S. National Plant Germplasm System	Log o							
Version: 2.0.3.3	Accessions Descriptors Reports GRIN Taxonomy ▼ GRIN ▼ Help Contact Us Tools ▼ Your Profile ▼								
PEANUTS									
	Contains characteristic/evaluation data on Peanut (Arachis) accessions as proposed by the Peanut Crop Germplasm Committee. For additional information, contact Shyar Tallury at the Plant Genetic Resources Conservation Unit, Griffin, GA 30223. Phone: (770) 229-3255. Email: Shyam.Tallury@ars.usda.gov.								
2 Descriptors 3	Species 4 Citations 5 Methods								
U.S. Peanut Descriptors, July	1995 publication								
United States Department of Agriculture	Jnited States								
Alesearch Service ARS-132 July 1995	Peanut Descriptors								
	NO OS QO DO								

- Keep the descriptors simple
- Use images and drawings to support textual descriptions
- Provide clear definitions of descriptors to enable others to apply them
- Analyse carefully the unit costs per measurement
- Specify the unit of measurement

Characterization Data

Guidelines

Each descriptor consists of a descriptor name, a descriptor state, and a descriptor *method* explaining how the descriptor should be measured and recorded.

> Descriptor elements

"bulletin13.pdf"

... a descriptor state ...

GG Values • Text • Numeric

• Coded

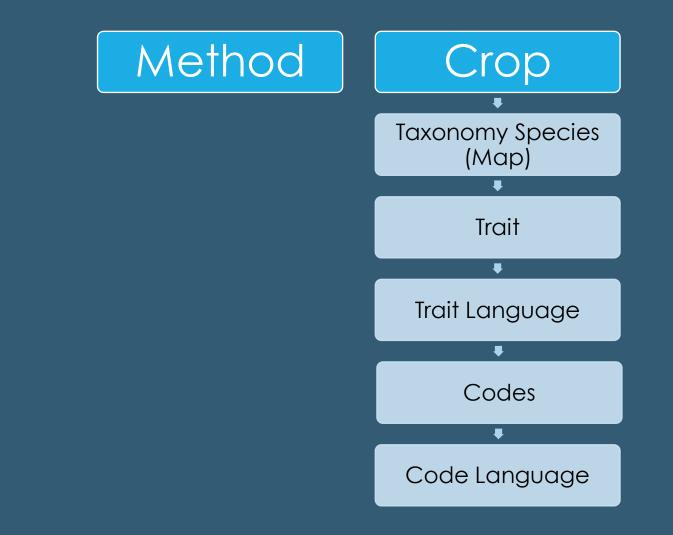
In GG, Observations are one of three possible types

A scary slide and then some interesting slides

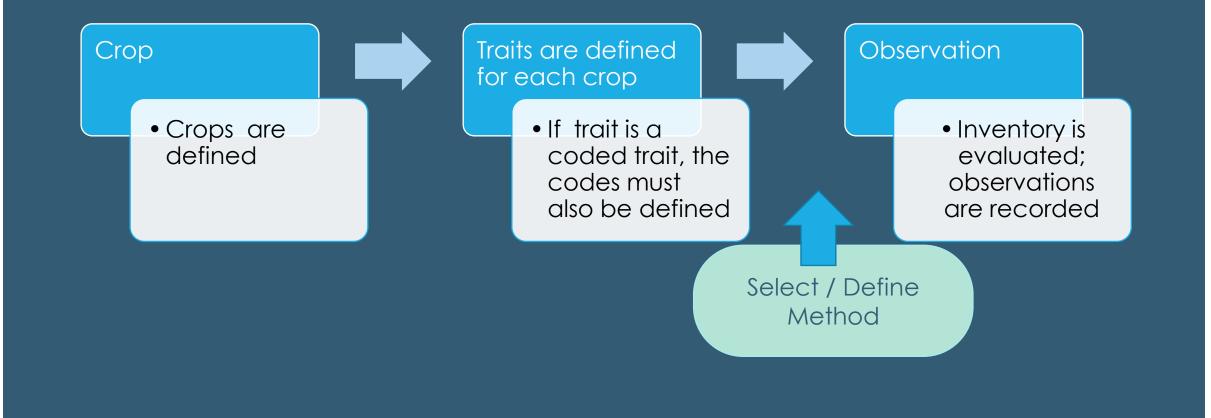
Jan Svensson

Data grouping	Data view	Comment
Сгор	Сгор	
	Crop attach	
	Taxonomy Crop Map	Specie(s) -> crop
Trait	Crop Trait	Main trait data
	Crop Trait Attach	
	Crop Trait Lang	
	Crop Trait Code	Main coded trait data
	Crop Trait Code Attach	
	Crop Trait Code Lang	
Method	Method	Trial info
	Method citation	
	Method attachment	
	Method Map	Trial cooperators
Scores (data)	Crop Trait Observation Data	(reps)
	Crop Trait Observation	(summary statistics)
Project (grouping of trials)	Project	GENBIS
	Project Map	GENBIS
	Project Method	GENBIS
Genbis	Crop Trait Observation Generator	GENBIS

Before adding any observation



Before an Observation Can Be Recorded...



GG hierarchy of Croprelated tables

5 main dataviews to be defined:

Crop Trait... Crop Trait Language... Crop Trait Code... Crop Trait Code Language...

References

• BIOVERSITY INTERNATIONAL TECHNICAL BULLETIN SERIES NO. 13

<u>cropgenebank.sgrp.cgiar.org/images/file/learnin</u>
 <u>g_space/technicalbulletin13.pdf</u>

References

<u>http://rrginc.com/gg/nordgenObs/</u>

CROP Table Records

ĺ	Get Site	Access	sions Inventor	Orders Cooperators Get Crop Trait Observation Get Crop Get Crop	Attach Get Crop T	rait Crop Trait L	ang	Get Crop Trait Code
		Crop ID	Crop 🔺	Note	Created Date	Created By	hooser	Select/Deselect
	Þ	86	PEANUTS	Contains characteristic/evaluation data on Peanut (Arachis) accessions as proposed by the Peanut Crop Gemplasm Committee. For additional information, contact Shyam Tallury at the Plant Genetic Resources Conservation Unit, Griffin, GA 30223. Phone: (770) 229-3255. Email: Shyam.Tallury@ars.usda.gov.	8/4/1994 8:09 AM	Sinnott, Quinn F	Options Column Chooser	Crop ID Crop Crop Note Created Date Created By Modified Date Modified By
			Other	✓ Owned Date ✓ Owned By				

Crop Trait

Get Site Accessions Inventory Orders Cooperators Get Crop Trait Observation Get Crop Get Crop Attach Get Crop Trait Crop Trait Lang Get Crop Trait Code Crop Trait Code Lang											
	Crop Trait ID	Сгор	Trait Name	Trait Title 🔺	Trait Description	ls Peer Reviewed?	Category	Data Type	ls Coded?	Maximum Length	
▶	86058	PEANUTS	ARACHIDATE	Arachidate (20:0)	Arachidate (20:0) methyl ester	N	Chemical composition de	Numeric descriptor	N	6	
	86059	PEANUTS	BEHENATE	Behenate (22:0)	Behenate (22:0) methyl ester	N	Chemical composition de	Numeric descriptor	N	6	
	86033	PEANUTS	CLUSTERNO	CORE CLUSTER NU	A cluster number used to group	N	Uncategorized descriptors	Alpha/numeric descri	Y	2	
	86038	PEANUTS	COUNTRYDES	CORE COUNTRY DE	Desgination of country of origin	N	Uncategorized descriptors	Alpha/numeric descri	Y	3	
	86039	PEANUTS	CORENO	CORE NUMBER	Peanut core numbers assigned	N	Uncategorized descriptors	Alpha/numeric descri	Ν	6	
	86040	PEANUTS	CORESET	CORE SET PROCED	The procedure used to select	N	Uncategorized descriptors	Alpha/numeric descri	Y	1	
	86041	PEANUTS	CORE	CORE SUBSET	A flag to indicate the accession	Y	A subset of a collection	Alpha/numeric descri	Y	1	
	86060	PEANUTS	EICOSENOATE	Eicosenoate (20:1)	Eicosenoate (20:1) methyl ester	N	Chemical composition de	Numeric descriptor	Ν	6	
	96061	PEANLITS	EPOYVESTERS	Enovy entern	Enoxy extern percentage	N	Chemical composition de	Numeric descriptor	IN	6	

Crop Trait Lang

Get	Site Accessi	ions Inventory	Orders Cooperators Get Crop Trait Obser	vation Get Cro	p Get Crop Attach Get Crop Trait Crop	Trait Lang Get Crop Trait Code Crop Trait Code Lan	g 🎉	
	Crop Trait Lang ID	Сгор	Crop Trait	Language	Trait Title	Trait Description		
	745	PEANUTS	GROWTH HABIT	English	GROWTH HABIT	Growth habit recorded at 60 to 70 days.	8/12/1	
	746	PEANUTS	LEAF COLOR	English	LEAF COLOR	Color of the leaf at 60 - 90 days	8/12/1	
	747	PEANUTS	LEAFSPOT	English	LEAFSPOT	Resistance to leafspot infection	8/12/1	
	748	PEANUTS	MATURITY	English	MATURITY	Maturity at harvest	8/12/1	
	749	PEANUTS	NORTHERN ROOTKNOT NEMATODE	English	NORTHERN ROOTKNOT NEMATODE	Resistance to Northern Rootknot Nematode	8/12/1	
	750	PEANUTS	PEANUT ROOTKNOT NEMATODE	English	PEANUT ROOTKNOT NEMATODE	Resistance to Peanut Rootknot Nematode	8/12/1	
	751	PEANUTS	POD CONSTRICTION	English	POD CONSTRICTION	Pod constriction at harvest, degree of depth of	8/12/1	
	752	PEANUTS	POD RETICULATION	English	POD RETICULATION	Pod reticulation at harvest, appearance of veins on	8/12/1	

Codes

m: Show All	Ge	t Site Acc	essions Invent	ory Orders Co	operators Get C	rop Trait Observation Get Crop	Get Crop	Trait Crop Trait Lang	Get Crop Trait Cod	Crop Trait
eisinger Resource Group, Inc. ~										
		Crop Trait Code	Сгор	Trait Name	Crop Trait	Trait Description	Trait Code	Code Title	Code Description	Created Da
Tab 1 CROPwebnar T · ·		ID								
OPwebnar Root Folder	•	11730	PEANUTS	PODTYPE	POD TYPE	U.S. pod market type	1	Spanish	Spanish	3/22/1996
an_MT-folder CROPS		11731	PEANUTS	PODTYPE	POD TYPE	U.S. pod market type	2	Valencia	Valencia	3/22/1996
PEANUTS		11732	PEANUTS	PODTYPE	POD TYPE	U.S. pod market type	3	Runner	Runner	3/22/1996
PEANUTS		11733	PEANUTS	PODTYPE	POD TYPE	U.S. pod market type	4	Virginia	Virginia	3/22/1996
POD SUARE		11734	PEANUTS	PODTYPE	POD TYPE	U.S. pod market type	5	Mixed	Mixed	3/22/1996

Crop Trait Code Lang

Get Site Accessions Inventory Orders Cooperators Get Crop Trait Observation Get Crop Get Crop Trait Crop Trait Lang Get Crop Trait Code Lang Get Crop Attach											
	Crop Trait Code Lang ID	Сгор	Crop Trait	Trait Name	Code Definition	Trait Title	Trait Description	Language	Code Title	Code Description	Crea
	11730	PEANUTS	POD TYPE	PODTYPE	Spanish	POD TYPE	U.S. pod market type	English	Spanish	Spanish	3/22/
	11731	PEANUTS	POD TYPE	PODTYPE	Valencia	POD TYPE	U.S. pod market type	English	Valencia	Valencia	3/22/
	11732	PEANUTS	POD TYPE	PODTYPE	Runner	POD TYPE	U.S. pod market type	English	Runner	Runner	3/22/
	11733	PEANUTS	POD TYPE	PODTYPE	Virginia	POD TYPE	U.S. pod market type	English	Virginia	Virginia	3/22/
•	11734	PEANUTS	POD TYPE	PODTYPE	Mixed	POD TYPE	U.S. pod market type	English	Mixed	Mixed	3/22/