

# Crops, Descriptors, & Observations

NordGen Webinar Series  
Session 2 – Jan. 10, 2024

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# Sessions

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

# Today

## Creating Ancillary (Related) Records and Standards – Session 2

Review selected material from FAO and USDA...

- **Methods** - agreeing on standards for Methods at NordGen
  - Citations
  - Literature
- Review **recommended conventions for Descriptors**  
... USDA GG crop curators and ... in Bioversity Internationals' Descriptor Guideline:  
[http://cropgenebank.sgrp.cgiar.org/images/file/learning\\_space/technicalbulletin13.pdf](http://cropgenebank.sgrp.cgiar.org/images/file/learning_space/technicalbulletin13.pdf)
- Discuss **MIAPPE**: Minimum Information About Plant Phenotyping Experiments
- **Scales** – Best Practices for Coded Values

- **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 ID	Name	Geography	Elevation (meters)	Latitude	Longitude	Uncertainty	Formatted Locality
497036	ProcinorteN	name -- The name describing					

the method environment and/or procedure

Method

What is a *Method*?

Why start with *Method*?  
(when planning evaluations /  
observations)

Method

In GG, are *Methods* only used for recording  
Observations?

...no...

The method table is linked to / from 13 places in the database

table_name	field_name
accession_action	method_id
crop_trait_observation	method_id
inventory_action	method_id
method_map	method_id
genetic_annotation	method_id
inventory_quality_status	method_id
crop_trait_observation_data	method_id
feedback_result_trait_obs	method_id
inventory	preservation_method_id
inventory	regeneration_method_id
citation	method_id
method_attach	method_id
accession_inv_group	method_id



# Methods provide a narrative – details for later reference

before any observations are recorded, the relevant method must be defined

# GG observation records w/ method highlighted

Accession Action	Accession	Site	Cooperator	Inventory	Inventory Maintenance Policy	Crop	Taxonomy	Crop Map	Crop Trait	Crop Trait Code	Crop Trait Observation	Method	Crop Atti
												Hummer%2019%	
Crop Trait Observation ID	Accession	Inventory	Crop	Crop Trait	Coded Value	Trait Code	Numeric Value	Is Archived?	Text Value	Method			
11789584	PI 616501	CFRA 288 .001 PL	STRAWBERRY	PLANT_HEIGHT			19.30000	N		Hummer et al.Strawbery Evaluation 2019			
11789818	PI 616501	CFRA 288 .001 PL	STRAWBERRY	Fruit harvest date			141.00000	N		Hummer et al.Strawbery Evaluation 2019			
11790301	PI 616501	CFRA 288 .001 PL	STRAWBERRY	FIRST_BLOOM			99.00000	N		Hummer et al.Strawbery Evaluation 2019			
11790307	PI 616511	CFRA 1027 .001 PL	STRAWBERRY	FIRST_BLOOM			101.00000	N		Hummer et al.Strawbery Evaluation 2019			
11790715	PI 616511	CFRA 1027 .001 PL	STRAWBERRY	Fruit harvest date			151.00000	N		Hummer et al.Strawbery Evaluation 2019			

Method

Hummer et al.Strawbery Evaluation 2019

Hummer et al.Strawbery Evaluation 2019

Hummer et al.Strawbery Evaluation 2019

Inventory Orders Web Order Request Cooperators **Method** Method Citation Method Map

Used

88 cultivars were planted in a field on the North Farm of the Road, Corvallis, Oregon, 97333-2521. For this field study, the cultivar were planted in a randomized complete block design are defined based on irrigation proximity and soil compaction. Series were planted around the perimeters of the plot and center

2m (2.5') x 0.762m (2.5') so that the plants can be tilled across using existing tractors and tillers. This prevents runners from different clones. Irrigation is provided by a center waterwheel that surrounds the plot. <br><br>

Spring-summer 2019:<br>Started early May <br>Watered weekly from 1 March through Mid-June <br>Runners per crown collected during the week of 1 July <br>Plants per runner<br>Runners per crown<br>

Column Chooser

Other Options

- Select/Deselect All
- Method ID
- Name
- Geography
- Elevation (meters)
- Latitude
- Longitude
- Uncertainty
- Formatted Locality
- Georeference Datum
- Georeference Protocol
- Georeference Annotation
- Material or Method Used
- Study Reason
- Created Date
- Created By
- Modified Date

## Method Record

# Editing the method record text...

The screenshot shows a web application interface with a navigation bar at the top containing tabs: 'Accessions', 'Accession IPR', 'Accession Inventory Attach', 'Inventory', 'Orders', 'Web Order Request', 'Cooperators', 'Method', 'Method Citation', and 'Method Map'. The 'Method' tab is highlighted with a red box. Below the navigation bar is a table with the following columns: 'Reference Protocol', 'Georeference Annotation', 'Material or Method Used', 'Study Reason', and 'Created Date'. The 'Material or Method Used' column contains text describing a field study. A text editor window is open over the table, displaying the text from the 'Material or Method Used' column. A yellow box with the text 'Ctrl - E' and a red arrow points to the text editor window.

Reference Protocol	Georeference Annotation	Material or Method Used	Study Reason	Created Date
on determine...		<p>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. &lt;br&gt;</p> <p>Plant spacing is 0.762m (2.5') x 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. &lt;br&gt;&lt;br&gt;</p> <p>Traits evaluated in spring-summer 2019:&lt;br&gt;</p> <ul style="list-style-type: none"><li>Plant Height measured early May &lt;br&gt;</li><li>First Flower Date taken weekly from 1 March through Mid-June &lt;br&gt;</li><li>Average number of runners per crown collected during the week &lt;br&gt;</li><li>Average number of plants per runner&lt;br&gt;</li><li>Average runner length per crown&lt;br&gt;</li><li>Mean harvest date&lt;br&gt;</li><li>Average fruit weight of 5 berries per crown&lt;br&gt;</li><li>Average individual fruit weight per accession&lt;br&gt;</li><li>Average petiole length per crown&lt;br&gt;</li><li>pH of fruit&lt;br&gt;</li><li>Soluble solid content&lt;br&gt;</li><li>Titrateable Acidity&lt;br&gt;</li></ul>		

Ctrl - E

# Method on the Website

[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') x 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

Average number of plants per runner



# Reviewing NPGS (USDA) Method Examples

<https://npgsweb.ars-grin.gov/gringlobal/descriptors>

Every Crop page lists Methods for that crop which had observations recorded

**Step 1 – Choose Crop**

- SUGARPOTATO
- SUGARCANE
- SUNFLOWER
- SWEET-CLOVER
- SWEETPOTATO**

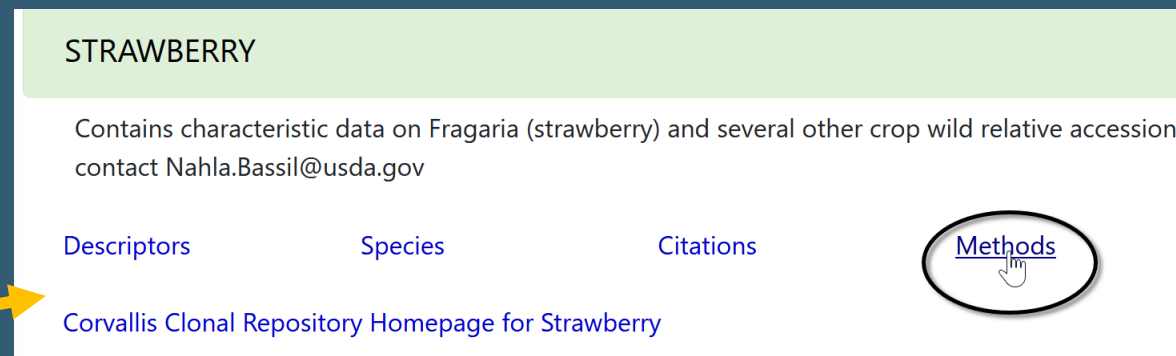
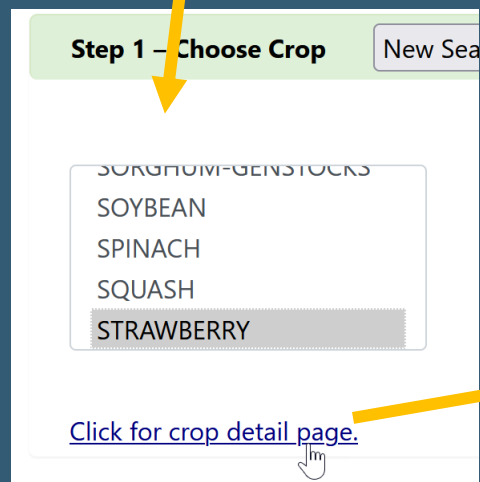
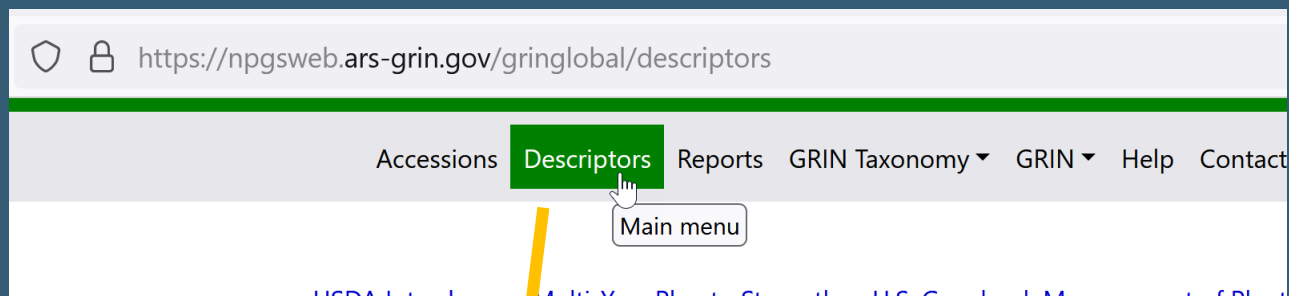
[Click for crop detail page.](#)

**SWEETPOTATO**

Contains characteristic/evaluation data on Sweetpotato accessions. For additional information, contact Ming Li Wang at the Plant Genetic Resources Conservation Unit (S-9), Griffin, GA 30223. Phone: (770) 229-3342. Email: [MingLi.Wang@ars.usda.gov](mailto:MingLi.Wang@ars.usda.gov).

[Descriptors](#)   [Species](#)   [Citations](#)   **[Methods](#)**

# Strawberry Methods



# Method Purpose

For observations - the method typically describes where and how the plant was grown and tested



# Method

When creating method records, include details –

... provide specifics and adequate information about the environment, the trial, etc.

# Method

- What you measure (e.g., plant height, days to flowering, days to harvest)
- How you measure (using a ruler, instrument, laboratory equipment, etc.)
- When you measure it (early vegetative stage, early reproductive stage, flowering stage, harvest)
- Who you have followed when obtaining descriptors (FAO, Bioversity, UPOV)
- Any changes or additions to the list of descriptors (modified or new descriptors)
- How you have controlled different factors that affect characterization data

# In the Curator Tool ... a method tip!

a Method item in the left panel can be used as a “filter” - in the datagrid, in the accession dataview, accessions w/ observations using that method will be listed

The screenshot displays the Curator Tool interface with two data views. The top view is the 'Accessions' datagrid, and the bottom view is the 'Crop Trait Observation' datagrid. Both views show a list of accessions with columns for ID, prefix, number, suffix, taxon, and name. The 'Crop Trait Observation' view also includes columns for inventory, crop, and trait. The 'MethodsDemo' folder in the left panel is highlighted, indicating it is used as a filter.

Site	Accessions	Crop Trait Observation	Accession IPR	Accession Inventory Attach	Inventory	Orders	Web Order Request
	Accession ID	Accession Prefix	Accession Number	Accession Suffix	Taxon		Name
	1183715	PI	231088		Fragaria x ananassa		Fukuba
	1183716	PI	231090		Fragaria x ananassa		Marshall (Japan)
	1203447	PI	270464		Fragaria x ananassa		Weisse Ananas
	1446336	PI	551400		Fragaria x ananassa		Micmac
	1446351	PI	551415		Fragaria x ananassa		Kurume 103

Site	Accessions	Crop Trait Observation	Accession IPR	Accession Inventory Attach	Inventory	Orders	Web Order Request
	Crop Trait Observation ID	Accession	Inventory	Crop	Crop Trait		Code
	12853386	PI 551429	CFRA 134 .001 PL	STRAWBERRY	Bloom date first [date]		
	12853393	PI 551494	CFRA 73 .001 PL	STRAWBERRY	Bloom date first [date]		
	12853394	PI 551504	CFRA 84 .001 PL	STRAWBERRY	Bloom date first [date]		
	12853397	PI 551509	CFRA 90 .001 PL	STRAWBERRY	Bloom date first [date]		
	12853403	PI 551560	CFRA 184 .001 PL	STRAWBERRY	Bloom date first [date]		
	12853404	PI 551561	CFRA 185 .001 PL	STRAWBERRY	Bloom date first [date]		
	12853408	PI 551577	CFRA 203 .001 PL	STRAWBERRY	Bloom date first [date]		
	12853409	PI 551578	CFRA 204 .002 PL	STRAWBERRY	Bloom date first [date]		
	12853410	PI 551586	CFRA 213 .001 PL	STRAWBERRY	Bloom date first [date]		
	12853412	PI 551594	CFRA 289 .001 PL	STRAWBERRY	Bloom date first [date]		

# GG Method Tables

(In the CT - Method Dataviews)

Method

Method Attach

attach images to Methods via attachment wizard

Method Citation

always use the Method Citation dataview when making method type citations

Method Map

relates Curators to Methods

# Method Attachment

Consider describing the method in a document (PDF) and save as a Method Attachment

Attachment Wizard v1.23.1.26

File

Attachment Type

Accession  Inventory  Accession/Inventory Group  Order Request  Method  Crop  Crop Trait  Crop Trait Code  Taxonomy Family  Taxonomy Genus  Taxonomy Species

Save Save and Exit

View Existing Attachments Batch Files...

View

Large  Small  List  Tile  Details

Attachments

ProcinorteNOV

method\_attach/ProcinorteNOV/straw

ProcinorteNOV

strawbery\_tg043.pdf

PDF

Form View Grid View

Title

Berry Descriptors

Description

But strawberry, not elderbery

Sort Order

Is Web Visible

Description Code Category Content Type

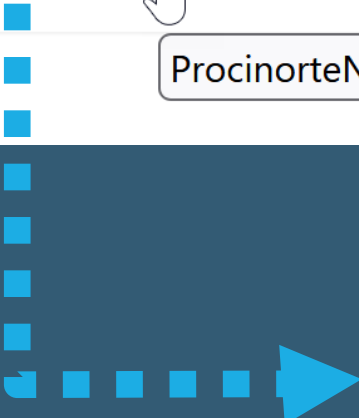
# ELDER-Procinorte

## Methods

[ProcinorteNOV](#)


Summer season was drier than average.

ProcinorteNOV



ProcinorteNOV

Summer season was drier than average.

 View for download

Trait(s) evaluated	
COLORCODED	1 Accessions
FRTCOLOR	1 Accessions

Links

[Berry Descriptors](#)



# Method Citation



Use the Method Citation dataview, not the Citation Dataview

... Let's discuss Citations in general...



# Method Citation

Search Criteria

@citation.method\_id IS NOT NULL

Clear Text

Search Results

Add To Query Clear Query Limit: 5000 Page Size: 1000

Taxonomy Crop Map Crop Trait Crop Trait Code Crop Trait Observation Method **Method Citation** Crop Attach Code Value Language Web Order Request Action We

Citation ID	Method	Author(s) Name	Citation Year	Reference Title	Citation Title	Abbreviated Literature Source	Referen
830930	POTATO.LBLIGHT.MICHELETTO.19...	Micheletto, S., M....	1999		Vertical resistanc...	Euphytica	110:13
831262	POTATO.PHENOLIC.NZARAMBA.20...	Nzaramba, M. N....	2007		Effect of propagu...	Amer J Potato	84:323
830953	WILD.SOYBEAN.EVAL.1IL85	Juvik, G. A., R. L....	1989		Evaluation of the ...	TBull USDA	1761

# Citations & Literature

- Citation records refer to existing Literature records
- Review Literature records periodically to reduce “duplications”
- Consider a Literature “data manager” who monitors and maintains the table

Crop Trait Observation   Accession IPR   Accession Inventory Attach   Inventory   Orders   Web Order Request   Cooperators   Method <b>Method Citation</b> Method Map   Crop									
	Citation Year	Reference Title	Citation Title	Abbreviated Literature Source	Reference	Literature Source	DOI Reference	URL	Reference Description
C. ...	1988		Response of six ...	Amer Potato J	65:605-612.	Amer Potato J			

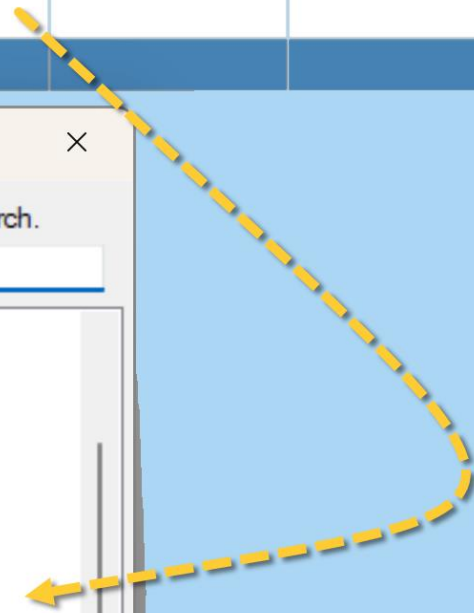
Lookup Picker v1.23.1.26

HINT: For big lists, use the text filter to shorten the list search.

Filter ->

- Amer Hort Mag
- Amer J Bot
- Amer J Enol Vitic
- Amer J Food Sci Tech
- Amer J For Med Path
- Amer J Molec Biol
- Amer J Ophthalmol
- Amer J PI Physiol
- Amer J PI Sci
- Amer J PI SciBiotech
- Amer J Potato
- Amer J Vet Res
- Amer Mid Nat

Refresh List   OK   Cancel



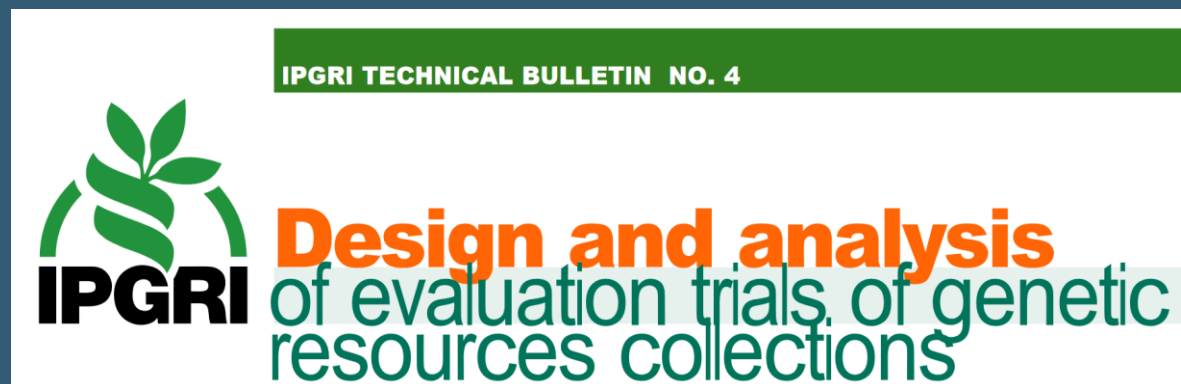
# GG Citations / Literature References

Guide: [http://grin-global.org/docs/gg\\_citations.pdf](http://grin-global.org/docs/gg_citations.pdf)

Webinar: [http://grin-global.org/qna/citations\\_2021may13\\_melsch.mp4](http://grin-global.org/qna/citations_2021may13_melsch.mp4)

# Method: Planning

Plan!



[https://cropgenebank.sgrp.cgiar.org/images/file/learning\\_space/technicalbulletin4.pdf](https://cropgenebank.sgrp.cgiar.org/images/file/learning_space/technicalbulletin4.pdf)

## ...excerpts

- ...In particular, the objectives of experiments are
- often too vaguely stated.
  
- Managers will need to consider *practical* aspects of the way their crops should be grown.

...excerpts

Do your clients find that the presentation of the information there, on your crops, is adequate for them to choose accessions?

... Do you know your clients' general needs...?,

(p. 10)

# Descriptors... some guidelines

- [https://cropgenebank.sgrp.cgiar.org/images/file/learning\\_space/technicalbulletin13.pdf](https://cropgenebank.sgrp.cgiar.org/images/file/learning_space/technicalbulletin13.pdf)



# GG differentiates between

- Crop Descriptors
- Source Descriptors

# (Crop) Characterization Descriptors

Characterization descriptors pertain to those traits that tend to be highly heritable traits ... visible to the naked eye, allow for quick and easy discrimination between accessions ...

Characterization descriptors may also include a limited number of additional traits **considered to be desirable by a consensus of users** of a particular crop.

- “For all quantitative descriptors, it is recommended to use actual measurements.

Where resources are insufficient to take actual measurements, quantitative characters that are continuously variable can be recorded on a 1–9 scale,  
...”  
...

## Example #46

### Continuously variable attribute

0	Absent
1	Very low
2	Very low to low
3	Low
4	Low to intermediate
5	Intermediate
6	Intermediate to high
7	High
8	High to very high
9	Very high

# a few basic guidelines...

- P. 43...

Is the descriptor dealing with one or more traits?

Avoid descriptors describing more than one characteristic

# Numeric versus alphanumeric coding schemes?

- Numeric

# For some qualitative descriptors,

- such as colour descriptors, it is important to know whether ... all states need to be separately recorded or ... can be ranked in a meaningful way ... one group name

# Qualitative using a scale

Nominal scales provide code numbers for traits that are defined by text (names or labels).

---

## **Example #29**

---

### **Fruit colour**

- 1 Yellow
- 2 Orange
- 3 Red
- 4 Brown
- 5 Purple

99 Other (specify in the descriptor Remarks)

---



## Mature Leaf Size

Number of accessions (318)

Equal to



3=SMALL ( < 8cm)

5=MEDIUM (8-15cm)

7=LARGE ( > 15cm)

# Pericarp Example

Avoid developing descriptors that describe more than one characteristic at the same time, (P45, step 3)

??? Definition:

THE COLOR AND THE PATTERN OF THE PERICARP. THE FIRST NUMBER IS THE COLOR, THE SECOND NUMBER IS THE PATTERN.

Descriptor: Pericarp Color (PERICARP-COLOR)

[Download list of accessions evaluated for this trait](#)

Definition:	THE COLOR AND THE PATTERN OF THE PERICARP. THE FIRST NUMBER IS THE COLOR, THE SECOND NUMBER IS THE PATTERN.
Crop:	<a href="#">MAIZE</a>
Category:	Morphological descriptors
Status:	Crop Germplasm Committee approved
Data Type:	Alpha/numeric descriptor
Maximum Length:	2
Responsible Site:	North Central Regional PI Station ( <a href="#">NC7</a> )

Pericarp Color

Number of accessions (9188)

Equal to

23=GREYISH WHITE / HALO  
31=RED / UNIFORM  
32=RED / VARIGATED  
33=RED / HALO

52=CHERRY / VARIGATED  
53=CHERRY / HALO  
54=CHERRY / TINGE  
59=CHERRY / OTHER

# Numeric Values Ranges vs Actual Measurements

## Root Size

Number of accessions (379)

Equal to



3=550-699 grams

4=700-849 grams

5=850-999 grams

9=Greater than or equal to 1000 grams

## Storage Root Weight

Number of accessions (174)

Equal to



56.7

68

85.1

90.7

# GG can do both numeric data and a scale at once (sort of)

[Flower Length](#)  
Number of accessions (106)  
Flower length in centimeters, average of ten typical flowers. Taken at growth stages 5-7.

Equal to

- 2.5
- 3
- 3.3
- 3.5

## Distribution of Values for Flower Length (FLOWERLEN)

### Range Number of Accessions

2.5 - 2.8	1
2.8 - 3	15
3 - 3.3	15
3.3 - 3.5	35
3.5 - 3.8	34
3.8 - 4	43
4 - 4.3	44
4.3 - 4.5	3
4.5 - 4.8	2
4.8 - 5	5

# Define qualitative descriptors

- If possible, add references or standards that illustrate the different descriptor states
- ... starting with '1'. If there is a need for space to list potential further states, add '99 Other'

**GG – Method &  
Crop Trait Attachments**

# Quantitative

On a 1 to 9 scale

(start from weak to strong expression of the trait).

### Example #55

**Table 2. Numeric codes linked to multilingual descriptor states**

<b>Numeric Code</b>	<b>Fruit: apex</b>	<b>Fruit: sommet</b>	<b>Fruto: ápice</b>
1	Indented	Déprimé	Hundido
2	Rounded	Arrondi	Redondeado
3	Pointed	Pointu	Puntiagudo
99	Other	Autre	Otro

## Boll Color

Number of accessions (5900)

Equal to

3=light green - lighter color than most of the cotton cultivars. Often seen  
4=red - red coloration to the boll color  
5=sun red - red coloration to the boll color in areas exposed to the sun  
9=seg/off type - plot is segregating or the rating is off the standard scale

## Boll Shape

Number of accessions (6333)

Equal to

2=round - round shape to the bolls. Not necessarily perfectly round but l  
3=cone - bolls are wider at the base and overall shape tapers to the tip. C  
4=cone oval - bolls show tapering from middle to the tip. The base and n  
9=seg/off type - plot is segregating or the rating is off the standard sca



# 22 Examples for Annex1 crops

see

<https://cgspace.cgiar.org/server/api/core/bitstreams/9ab70a0f-1aa8-4df6-b64f-bc68e3891ee1/content22>

# Bioversity International

<https://cgspace.cgiar.org/server/api/core/bitstreams/9ab70a0f-1aa8-4df6-b64f-bc68e3891ee1/content>

<https://alliancebioiversityciat.org/publications-data/key-characterization-and-evaluation-descriptors-methodologies-assessment-22-crops>

<http://www.bioversityinternational.org/e-library/publications/detail/key-characterization-and-evaluation-descriptors/>



## Key Characterization and Evaluation Descriptors:

Methodologies for the

# UPOV Tables of Characteristics

(Union for the Protection of New Varieties)

[https://www.upov.int/test\\_guidelines/en/list.jsp](https://www.upov.int/test_guidelines/en/list.jsp)

Lists 333 crops and how to evaluate them in the field for Distinction, Uniformity and Stability

The screenshot shows the UPOV website interface. At the top, the UPOV logo is displayed. Below it, a navigation menu includes 'ABOUT UPOV', 'MEMBERSHIP', 'UPOV SYSTEM', 'PVP DATA & STATISTICS', 'MEETINGS', and 'NEWS'. The 'UPOV SYSTEM' menu item is highlighted. On the left side, there is a 'TEST GUIDELINES' sidebar with options for 'Home', 'List All', and 'Search'. The main content area shows a breadcrumb trail: 'HOME > UPOV SYSTEM > TEST GUIDELINES >'. Below this, a blue header reads 'List all Test Guidelines by TG Reference'. A circled text element indicates 'Total: 338'. The main content is a table with the following structure:

CODE	ENGLISH	FRANÇAIS	DEUTSCH	ESPAÑOL	LATIN	FILES
002	Maize	Maïs	Mais	Maíz	Zea mays L.	<a href="#">DE</a> <a href="#">EN</a> <a href="#">ES</a> <a href="#">FR</a>
003	Wheat	Blé	Weizen	Trigo	Triticum aestivum L. emend. Fiori et Paol.	<a href="#">DE</a> <a href="#">EN</a> <a href="#">ES</a> <a href="#">FR</a>
004	Ryegrass	Ray-grass	Weidelgras	Raygrás	Lolium perenne L.; Lolium multiflorum	<a href="#">DE</a> <a href="#">EN</a> <a href="#">ES</a> <a href="#">FR</a>

# MIAPPE

Minimum Information About a Plant  
Phenotyping Experiment

list of attributes recommended for the  
description of phenotypic observations

<https://www.miappe.org/>

# MIAPPE

contains the properties that should be provided

... alongside experimental results to ensure easy and correct interpretation, assessment, review and reproducibility

# MIAPPE

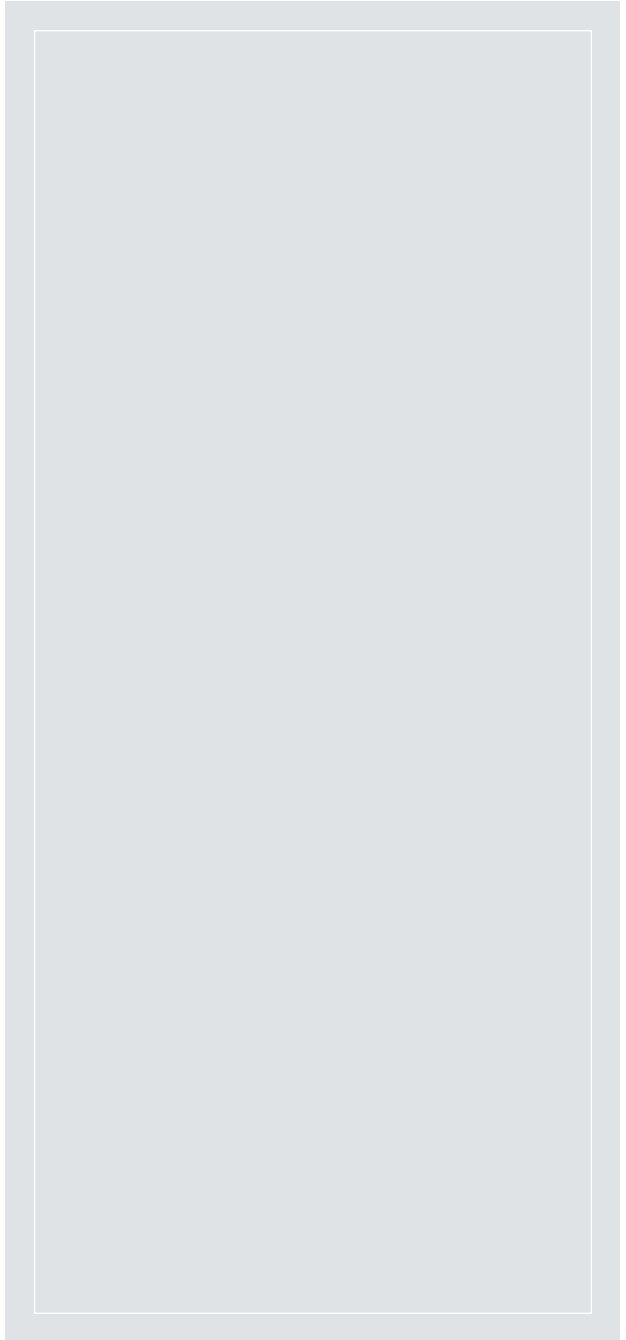
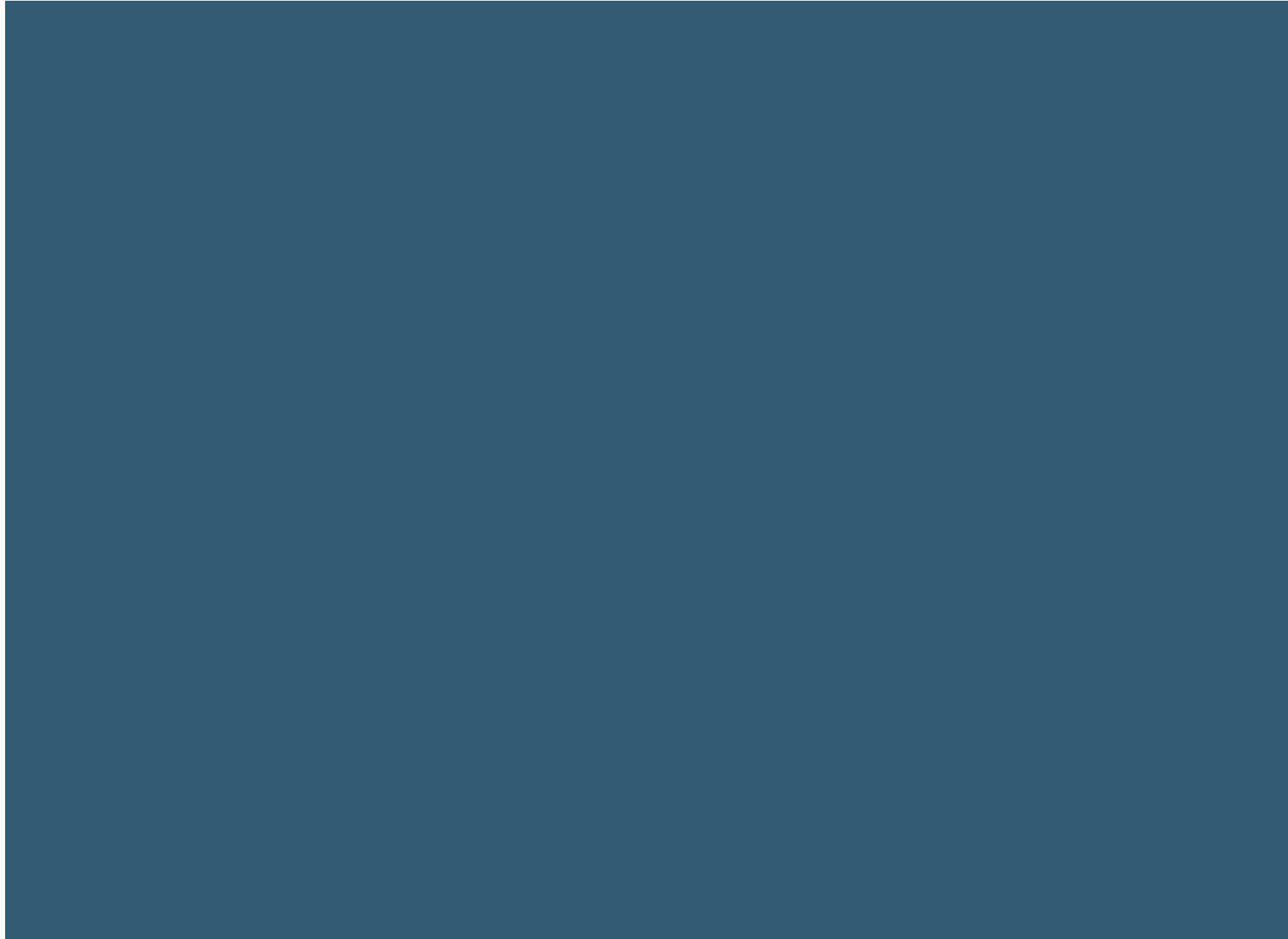
Table 1:

<https://plantmethods.biomedcentral.com/articles/10.1186/s13007-016-0144-4/tables/1>

# MIAPPE

The MIAPPE checklist consists of attributes that can be classified within the following sections:

- General metadata,
- Timing and location,
- Biosource,
- Environment,
- Treatments,
- Experimental design,
- Sample collection, processing, management,
- Observed variables.





# Homework

Read:

- [http://cropgenebank.sgrp.cgiar.org/images/file/learning\\_space/technicalbulletin13.pdf](http://cropgenebank.sgrp.cgiar.org/images/file/learning_space/technicalbulletin13.pdf)
- <https://plantmethods.biomedcentral.com/articles/10.1186/s13007-016-0144-4>
- [https://cropgenebank.sgrp.cgiar.org/images/file/learning\\_space/technicalbulletin4.pdf](https://cropgenebank.sgrp.cgiar.org/images/file/learning_space/technicalbulletin4.pdf)

# Homework

- Create a method record
- Create a method-attachment record for your method
- Create a method-map record for your method

# Homework

- [https://www.upov.int/test\\_guidelines/en/list.jsp](https://www.upov.int/test_guidelines/en/list.jsp)
- Review one or two of your crops

# Homework

- Find your crop(s) at the USDA NPGS GG website.
- Review:
  - The methods used
  - The descriptors that were measured

# Homework

- <https://cgspace.cgiar.org/server/api/core/bitstreams/9ab70a0f-1aa8-4df6-b64f-bc68e3891ee1/content>

- If your crop is in the list, check it out:

## **Key Characterization and Evaluation Descriptors:**

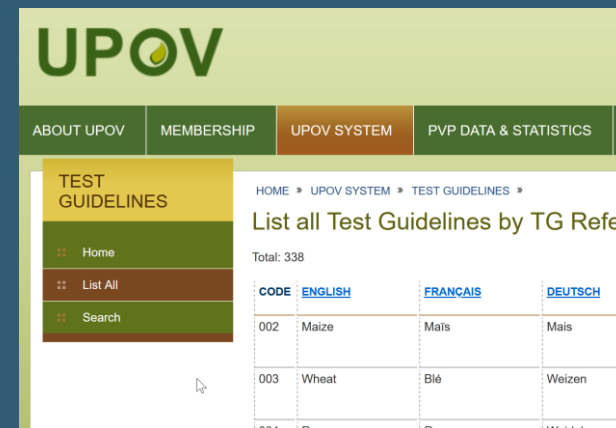
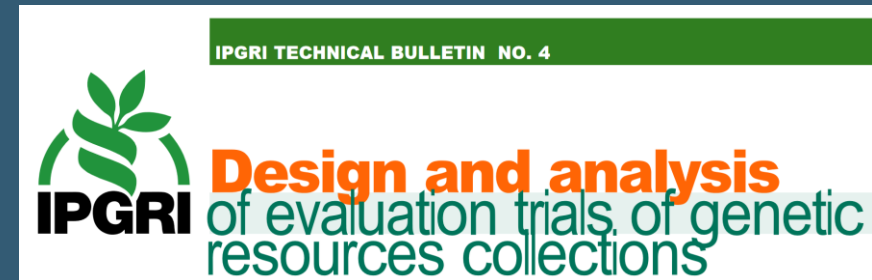
Methodologies for the Assessment of 22 Crops

# Homework

Read:

[https://cropgenebank.sgrp.cgiar.org/images/file/learning\\_space/technicalbulletin4.pdf](https://cropgenebank.sgrp.cgiar.org/images/file/learning_space/technicalbulletin4.pdf)

- [https://www.upov.int/test\\_guidelines/en/list.jsp](https://www.upov.int/test_guidelines/en/list.jsp)



UPOV

ABOUT UPOV MEMBERSHIP UPOV SYSTEM PVP DATA & STATISTICS

TEST GUIDELINES

HOME » UPOV SYSTEM » TEST GUIDELINES »

List all Test Guidelines by TG Refer

Total: 338

CODE	ENGLISH	FRANCAIS	DEUTSCH
002	Maize	Mais	Mais
003	Wheat	Blé	Weizen
004	Bluegrass	Ray-grass	Weidelgras

The image is a screenshot of the UPOV website. At the top, the UPOV logo is displayed in green. Below it is a navigation menu with four items: 'ABOUT UPOV', 'MEMBERSHIP', 'UPOV SYSTEM', and 'PVP DATA & STATISTICS'. The 'UPOV SYSTEM' item is highlighted in orange. Below the navigation menu, there is a sidebar on the left with the heading 'TEST GUIDELINES' and three menu items: 'Home', 'List All', and 'Search'. The 'List All' item is highlighted in orange. The main content area shows a breadcrumb trail 'HOME » UPOV SYSTEM » TEST GUIDELINES »' and the title 'List all Test Guidelines by TG Refer'. Below the title, it says 'Total: 338'. A table with four columns is shown: 'CODE', 'ENGLISH', 'FRANCAIS', and 'DEUTSCH'. The table contains three rows of data: 002 (Maize/Mais/Mais), 003 (Wheat/Blé/Weizen), and 004 (Bluegrass/Ray-grass/Weidelgras).

# Other References

- <https://plantmethods.biomedcentral.com/articles/10.1186/s13007-016-0144-4>
- [https://cropgenebank.sgrp.cgiar.org/images/file/learning\\_space/technicalbulletin4.pdf](https://cropgenebank.sgrp.cgiar.org/images/file/learning_space/technicalbulletin4.pdf)
- USDA's Descriptors on GG:  
<https://npgsweb.ars-grin.gov/gringlobal/descriptors>

