



**JKI**

**Julius Kühn-Institut**

Bundesforschungsinstitut für Kulturpflanzen  
Federal Research Centre for Cultivated Plants

# **C&E data in the European *Avena* Database and the International Database for *Beta***

**Christoph U. Germeier**

[www.jki.bund.de](http://www.jki.bund.de)

Basic concepts

E+C data presentation in the EADB and IDBB

E+C data acquisition in the AVEQ project

Used technology for AVEQ

## Basic Concepts: Philosophy

- Store all data as original as available.
- Measurement data in SI units are generally preferred.  
(Algorithms to generate easy to read scores from measurement data can be made available more or less easily while reconstruction of original measurement results from scores is not possible).
- Give all background information as considered necessary for scientific publication in atomised (= searchable, sort able, filterable) form: methodological, experimental, geographic.
- Offer the user an easy to read ranking (1-9) for first orientation, but give him the possibility also to go into original data.

# Structure of the Observation Table



Identifiers (Foreign Keys)			Text Data
<b><i>GENOTYPE / ACCESSION</i></b>			
<b>HolderCode</b>	Char 15		OriginalScore Char 8
<b>AccessionNumber</b>	Char 15		Homogeneity Char 15
<i>GenotypeID</i>	<i>Integer</i>		Remark Char 70
<i>Accession/StandardName</i>	<i>Char 50</i>		DataAvailable Char 2
<b><i>METHODOLOGY</i></b>			
<b>DescriptorID</b>	Integer		
<b>MethodID</b>	Integer		
<b><i>EXPERIMENTAL</i></b>			
<b>ExperimentID</b>	Integer		
<b>TreatmentCode</b>	Char 15		
<b><i>ORIGINAL PLOT</i></b>			
<i>OriginalPlot</i>	<i>Char 15</i>		
<b>Numeric Data</b>			
		ScoringDate	Date
		ScoringStage	Integer
		Replications	Integer
		PlantsTested	Integer
		AbsoluteValue	Float
		Percentage	Float
		NumericScore	Float
		Frequency	Float
<b><i>STATISTICS</i></b>			
		StandardDeviation	Float
		StandardError	Float
		VariationCoefficient	Float
		Minimum	Float
		Maximum	Float
		Skewedness	Float
		Kurtosis	Float
<b><i>STANDARDISED DATA</i></b>			
		UniversalScore	Float

# Data presentation: query generator



Adresse <http://eadb.bafz.de/eadb/index.html> Wechseln zu Links

Adresse <http://eadb.bafz.de/eadb/index.html> Wechseln zu Links

**EADB**  
European Avena  
Database

---


[Introduction](#)  
[Online SEARCH](#)  
[GENRES SEARCH](#)  
(password protected)  
[EADB Help](#)

---

[Your Feedback](#)

---

[GENRES](#)  
[BAZ Genebank](#)  
[Project GENRES 99-106](#)  
[Home](#)



## EADB

### European Avena Database

**Display results**

<input type="button" value="Cross table"/>	for selected characterisation and evaluation descriptors	aggregated <input checked="" type="checkbox"/>
<input type="button" value="Observations"/>	for selected characterisation and evaluation descriptors	<input checked="" type="checkbox"/>
<input type="button" value="Standard observations"/>	listed for selected characterisation and evaluation descriptors	<input checked="" type="checkbox"/>
<input type="button" value="Observation methodology"/>	used for the selected characterisation and evaluation descriptors	
<input type="button" value="Experimental details"/>	for the selected characterisation and evaluation observations	
<b>include duplicates</b>		
<input type="button" value="Passport data"/>	for the selected accessions as available	<input checked="" type="checkbox"/>
<input type="button" value="Genebanks"/>	holding the selected accessions	<input checked="" type="checkbox"/>
<input type="button" value="Pictures"/>	for the selected accessions as available	
<input type="button" value="Alleles"/>	found for the selected traits and accessions	<input type="button" value="Genotype wise"/>


# Data presentation: Observation – Cross Table

ObservationControl -> reportCrosstable(...)

Display results



**Cross table for the selected accessions**



TAXON_CULTIVAR	HOLDERFAOCODE	ACCESSIONNUMBER	PROTEIN_IN_CARYOPSIS	SEED_WEIGHT	SHAPE_OF_PANICLE
Avena sativa var. brunnea Koern. [Milton]	DEU001	16758	7	5	1,8
Avena sativa [Noire Champenoise A Grappes]	FRA040	19286	8	2,5	1,3
Avena sativa ssp. sativa convar. sativa var. aurea Koern. [Madrid]	DEU001	16792	9	7,4	1,8
Avena sativa ssp. sativa convar. orientalis var. flava Koern. [Local]	RUS001	8479	7	2,3	1
Avena sativa var. aristato-nigra [Joanette ( Avoine De Chenailles )]	FRA040	19371	7	1	1
Avena sativa ssp. sativa convar. sativa var. mutica ALEF. [Storm King]	GBR005	01256	1,5	8,8	1,3


BAZ Gene Bank Braunschweig, Germany  
 Powered by: German Centre for Documentation and Information in Agriculture (ZADI)

# Data presentation: Observation – Listing

ObservationControl -> reportListing(...)



Adresse <http://eadb.bafz.de/eadb/rptResult.php> Wechselt zu Links




### Observation details for the selected accessions



TAXON_CULTIVAR	HOLDERFAOCODE	ACCESSIONNUMBER	DESCRIPTOR	UNIT	EXPERIMENTS	UNIVERSALSCORE	ABSOLUTEVALUE	PERCENTAGE	NUMERICSCORE	MINIMUM	MAXIMUM
Avena sativa var. brunnea Koern. [Milton]	DEU001	16758	Seed weight	g	5	5	26,3			22	32
Avena sativa var. brunnea Koern. [Milton]	DEU001	16758	Shape of panicle	Score	6	2			2,2	1	4

Adresse [http://eadb.bafz.de/CCDB\\_PHP/main/Download.php](http://eadb.bafz.de/CCDB_PHP/main/Download.php) Wechselt zu Links >>

A2 = TAXON\_CULTIVAR

	A	B	C	D	E	F	G	H	I	J	K	L
	TAXON_CUL	HOLDERFAC	ACCESSION	DESCRIPTOR	UNIT	EXPERIMENT	UNIVERSALS	ABSOLUTEV	PERCENTAG	NUMERICSC	MINIMUM	MAXIMUM
3	Avena sativa	DEU001	16758	Seed weight	g	5	5	26,3			22	32
4	Avena sativa	DEU001	16758	Shape of pan	Score	6	2			2,2	1	4
5	Avena sativa	DEU001	16758	Protein in car	%	1	7		14		14	14
6	Avena sativa	FRA040	19286	Seed weight	g	4	3	23			21	25
7	Avena sativa	FRA040	19286	Shape of pan	Score	4	1			1,3	1	2
8	Avena sativa	FRA040	19286	Protein in car	%	1	8		16		16	16
9	Avena sativa	DEU001	16792	Seed weight	g	5	7	31,4			27	35
10	Avena sativa	DEU001	16792	Shape of pan	Score	5	2			2,7	1	6
11	Avena sativa	DEU001	16792	Protein in car	%	1	9		15		15	15
12	Avena sativa	RUS001	8479	Seed weight	g	4	2	24,4			21	29
13	Avena sativa	RUS001	8479	Shape of pan	Score	4	1			1	1	1

Download

# Data presentation: Methodology




MethodologyControl -> reportMethodology(...)

Adresse <http://eadb.bafz.de/eadb/rptResult.php> Wechseln zu Linkss



Panicle	IBPGR 4.2.1 Shape of panicle	Stage 65-75									
	<b>IBPGR 4.2.1 Panicle shape rating</b>	<b>Score</b>									
		<table border="1"> <thead> <tr> <th>ORIGINAL</th> <th>HARMONIZED</th> <th>KEYDESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>Unilateral</td> </tr> <tr> <td>2</td> <td>3</td> <td>Equilateral</td> </tr> </tbody> </table>	ORIGINAL	HARMONIZED	KEYDESCRIPTION	1	1	Unilateral	2	3	Equilateral
ORIGINAL	HARMONIZED	KEYDESCRIPTION									
1	1	Unilateral									
2	3	Equilateral									

BAZ Gene Bank Braunschweig, Germany  
 Powered by: German Centre for Documentation and Information in Agriculture (ZADI)



European  
Cooperative  
Programme  
for Crop  
Genetic  
Resources  
Networks  
**ECP/GR**

**Methodology used in  
selected observations**

Bundesministerium  
für Verbraucherschutz, Ernährung  
und Landwirtschaft

Panicle	IBPGR 4.2.1 Shape of panicle	Stage 65-75												
	<b>BSA 8 Orientation of lateral branches</b>	<b>Score</b>												
	In a drill plot (3,9 m2, row distance 20cm, 6 rows, 1000 plants) rating when first spikelet visible in 50% of panicle	<table border="1"> <thead> <tr> <th>ORIGINAL</th> <th>HARMONIZED</th> <th>KEYDESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>Unilateral</td> </tr> <tr> <td>2</td> <td>2</td> <td>Subunilateral</td> </tr> <tr> <td>3</td> <td>3</td> <td>Equilateral</td> </tr> </tbody> </table>	ORIGINAL	HARMONIZED	KEYDESCRIPTION	1	1	Unilateral	2	2	Subunilateral	3	3	Equilateral
ORIGINAL	HARMONIZED	KEYDESCRIPTION												
1	1	Unilateral												
2	2	Subunilateral												
3	3	Equilateral												

and Evaluation Data



# Data presentation: Experiment



ExperimentControl -> reportExperiments(...)





Display result

- Standards
- Observations
- Experiments**

Adresse <http://eadb.bafz.de/eadb/rptResult.php> Wechseln zu Links

### Settings for the selected Experiments

**2001AVEN04:**

**EU funded GENRES106**  
 Evaluation and enhancement of Avena landrace collections for extensification of the genetic basis of Avena for quality and resistance breeding

**2001**

AccessionMeans
AccessionScores
StandardMeans
StandardScores

Institution	Site	Description
<b>Federal Centre for Breeding Research on Cultivated Plants - Genebank</b> <i>Bundesanstalt für Züchtungsforschung - Genbank</i>  Bundesallee 50 D-38116 Braunschweig DEU: GERMANY	ENVIRONMENT Experimental Field COUNTRY DEU: GERMANY STATE Niedersachsen DISTRICT Braunschweig LOCATION Volkenrode FARM FAL - Versuchsstation SITE Hauptfeld 4	Evaluation: 308 landrace / traditional cultivar accessions + 4 blocks of 10 project standards from five European project partners (2 standards from each partner)

#### Treatments

TREATMENT	SOWING	ROW_CM	SEEDS_PER_QM	PLOT_QM	IRRIGATION	INFESTATION	TILLAGE	FERTILIZER
Extensive Low input	20010409	25	120	x	Both/alternate		traditional: plow < 30cm	None

# Data presentation: Pictures



PictureControl -> reportPictures(...)

Adresse <http://eadb.bafz.de/eadb/rptResult.php> Wechseln zu Links

**Pictures for the selected accessions and their duplicate groups**

<i>Avena sativa</i> L. [Ladiz. biol. species] - <i>Avena sativa</i> var. <i>nigra</i> Krause - <i>Avena sativa</i> ssp. <i>sativa</i> convar. <i>orientalis</i> var. <i>tristis</i> Alef. ['Rodionova et al. 1994' System(s)]		Haig Sir Douglas (Earl)	GBR: UNITED KINGDOM	1926-1991
<b>Origin</b>		<b>Collecting Site</b>		
SAMPLESTATUS	Advanced cultivar			
COLLECTINGDATE	1926			
<b>Picture Data</b>		<b>Agronomic Data</b>		
		GRAIN YIELD [76-]189.5[-303] g/m <sup>2</sup> Seed weight [31-]36.9[-41] g Test weight 45.4 kg/hl Biomass yield 578.2 g/plot Days to heading [45-]67[-92] Days Height of plant [99-]116.1[-149] cm Protein in caryopsis [16-]16[-17] % Lodging at mature stage [0-]2.9[-6] Score Erysiphe graminis avenae 9 Score Puccinia coronata avenae 9 Score		
HOLDER	DEU146			
ACCESSION	AVE 643			
PROJECT	GENRES106			
EXPERIMENT	2003AVEN14			
DATE	2003-07-11			

# Geographic visualisation of C+E Data (IDBB)





## Map selected accessions and traits





Bundesministerium  
für Verbraucherschutz, Ernährung  
und Landwirtschaft

↑

← →

↓

+

-

Karte **Satellit** Hybrid



On click display for selected accession:

- Passport
- Evaluation
- Pictures

Trait

Virus aberrations

Descriptor

Rizomania

Operator

Max

Compare

<=

Score

3 : low sign of susceptibility

BAZ Gene Bank Braunschweig, Germany  
Powered by: German Centre for Documentation and Information in Agriculture (ZADI)

1 of 1

# Data acquisition in AVEQ:

## Vision of the web application



Facilitate inclusion of project data into a central database by:

- > promoting standardized ways of data generation.
- > take over routine calculations.
- > promote standardization of concepts and identifiers (ontologies).
- > create a repository of web solutions (tool set) for managing cooperative multisite genetic resources work.

Issues:

- Project methodology
- Field plans
- Scoring lists and Excel templates for data input
- Input harvest results
- Import Excel spreadsheets

# Data acquisition in AVEQ: Used Technology



## Java Enterprise Edition (JEE 5) Frameworks and Components:

- JBoss Application Server
- Hibernate: Database-Abstraction / Object Relational Mapping
- Seam / SeamGen
- Rich Faces (Implementation of Java Server Faces Standards)

All used frameworks and components including the application server are open source and available without costs.  
The source code will be made available in CropForge.

# Generate fieldplan



**Generate fieldplan**

Cancel
Create fieldplan

**Selected Accessions**

**Evaluation**

evaluationId	addressCode	addressFaocode	par
2008AVEQQualityDEUSeeds			

**Created experiment**

**Name** testXXL

**Replications** 5

**Plots per lane** 32

---

Selected 11 standards

---

Selected 312 entries


**Set marker at block boundaries?**

**Set marker for field orientation?**

# Generate fieldplan



Meistbesuchte Seiten Erste Schritte Aktuelle Nachrichten BAZ: Startseite Deutsch firefox http://www.google.d...

 Avena genetic resources for quality in human consum

Collection Seed transfer Viability test Seed multiplication Methodology Field evaluation Analytics

View Fieldplan

testXXL [Download pdf](#)

Fieldplan **Fieldlist** Sowinglist

Lanes>	1	2	3	4	5
Plots					
32	I FRA040 30038 CHIMENE A. sativa	I DEU146 AVE 1013 Cenad 88 A. sativa subsp.sativa var.mutica	II CZE074 Azur Azur A. sativa	II DEU146 AVE 2954 ovaz A. sativa subsp.sativa var.aurea	III EST001 00011 Miku A. sativa subsp.sativa var.aurea
31	I RUS001 200107022 LOCAL A. sativa subsp.sativa var.persica	I <b>BGR001 A7BM0001</b> Mina A. sativa subsp.nudisativa	II DEU087 CPVO19990291 FREDDY A. sativa	II DEU060 DEU101-HA 1176 Flämingsprofi A. sativa	III DEU146 AVE 4794 Wirchenblatter A. sativa

# Generate rating list



Collection   Seed transfer   Viability test   Seed multiplication   Methodology   **Field evaluation**   Analytics

Generate rating list

Generate PDF   Generate XLS

Select methodology

Sowing year	Cod	<u>First stage</u>	Last stage	Name	Trait	Status	Method	Unit	Method code	Method description															
2007	AVEQInc'	<input checked="" type="checkbox"/>	09	11	Emergence	Agronomy	optional	Emergence count along rows	Number		Count the number of emerged plants along one meter in two neighbouring rows per plot														
2007	AVEQInc'	<input type="checkbox"/>	25	29	Growth habit	Habit		Growth habit rating UPOV	Score	UPOV 1 / BSA 1	At juvenile stage, angle of the tillers from the vertical in a drill plot (3,9 m2, row distance 20cm, 6 rows, 1000 plants) <a href="#">Show keys</a>														
2007	AVEQInc'	<input checked="" type="checkbox"/>	31	73	Barley yellow dwarf virus	Disease	on occurrence	BYDV Rating: Combined Method Plot Percentage and Score	Score		Estimate percentage of plants infected in the plot. Score most infected plant according to scale. <table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>no symptoms</td> </tr> <tr> <td>3</td> <td>slight dwarfing</td> </tr> <tr> <td>5</td> <td>considerable dwarfing</td> </tr> <tr> <td>7</td> <td>considerable dwarfing and small panicles</td> </tr> <tr> <td>8</td> <td>no tillering</td> </tr> <tr> <td>9</td> <td>plant dead</td> </tr> </tbody> </table>	Key	Description	1	no symptoms	3	slight dwarfing	5	considerable dwarfing	7	considerable dwarfing and small panicles	8	no tillering	9	plant dead
Key	Description																								
1	no symptoms																								
3	slight dwarfing																								
5	considerable dwarfing																								
7	considerable dwarfing and small panicles																								
8	no tillering																								
9	plant dead																								



# Generate rating list



Experiment Code: AVEQInc12

Descriptor	<b>Emergence</b>										
Descriptor code											
Trait code	Agronomy										
Method	Emergence count along rows										
Unit	Number										
Method code											
Method description	Count the number of emerge										
Sample size	2										
Status	optional										
Keys											

Lane	Plot	Status	FAO code	Accession number	Date	Stage min	Stage mean	Stage max	Emergence (Number)	Barley yellow dwarf virus (Score)
1	1	Marker								

Microsoft Excel - rating\_listXLS.xls [Schreibgeschützt]

Frage hier eingeben

Arial 10

A	B	C	D	E	F	G	H	I	J	K	L	M
Lane	Plot	Status	FAO cod	Accession number	Date	Stage min	Stage mean	Stage max	Emergence (Number) 1	Emergence (Number) 2	Barley yellow dwarf virus (Score) 1	Barley yellow dwarf virus (Score) 2
1	1	Marker										
2	1	1	Standard	DEU481	CPVO20022073							
3	1	2	Project	RUS001	200110506							
4	1	3	Project	FRA040	19631							
5	1	4	Project	POL003	PL51466							
6	1	5	Project	RUS001	200108062							
7	1	6	Project	DEU146	AVE 1626							
8	1	7	Project	RUS001	200110612							
9	1	8	Project	CZE047	03C0700043							
10	1	9	Project	ROM007	ROM007-16701							
11	1	10	Standard	SWE002	NGB8760							
12	1	11	Project	POL003	PL50403							
13	1	12	Project									

# Input harvest results



**Edit fieldlist for experiment 2x300**

Save changes

Navigation: << < 1 2 3 4 5 6 7 8 > >>

Treatment	Lane	Plot	FAO code	Accession	Plot yield [g]	Plot yield [g dm]	TGW sample	TGW [g]	TGW [g dm]	Number of seeds	Moisture [%]	Testweight [kg/hl]
FullPlot	1	1			<input type="text"/>		<input type="button" value="Input TGW samples"/>				<input type="text"/>	<input type="text"/>
FullPlot	1	2	DEU146	AVE 4259	909.59		<input type="button" value="Input TGW samples"/>	27.4778		33103	6.6	41.7
FullPlot	1	3	HUN003	RCAT011413	<input type="text"/>		<input type="button" value="Input TGW samples"/>				<input type="text"/>	<input type="text"/>
FullPlot	1	4	BGR001	BGR 351	223.14						<input type="text"/>	<input type="text"/>
FullPlot	1	5	AUT001	BVAL-450001	673.66						10.2	55.3
FullPlot	1	6	SWE006	CPVO19960125	<input type="text"/>						<input type="text"/>	<input type="text"/>
FullPlot	1	7	CZE047	Saul	<input type="text"/>						<input type="text"/>	<input type="text"/>

**enter TGW**

Experiment 2x300	FAO code HUN003
Lane 1	Accession number RCAT011413
Plot 3	

**Enter Values**

Count	Weight	Date	TGW
<input type="text"/>	<input type="text"/>	20090301	g
<input type="text"/>	<input type="text"/>	20090301	g
<input type="text"/>	<input type="text"/>	20090301	g

# Import Spreadsheet



**Import spreadsheet**

Cancel Save import protocol

Experiment code 1x150

Filename ratingListXLS-1X150Emerg.xls

Selected sheet Sheet1

Selected header row Lane Plot Status Holder FaoCode Accession Number Date Stage min

Emergence 2

**Map columns of your spreadsheet to database items**

column	columnHead	Item	Status	Trait	Descriptor	Method ID	Method code
0	Lane	Lane					
1	Plot	Plot					
2	Status	Status					
3	Holder FaoCode	HolderCode					
4	Accession Number	AccessionNumber					
5	Date	ScoringDate	DD.MM.YY				
6	Stage min	ScoringStageMin					
7	Stage mean	ScoringStage					
8	Stage max	ScoringStageMax					
9	Emergence 1	AbsoluteValue		Agronomy	Emergence	322	
10	Emergence 2	AbsoluteValue		Agronomy	Emergence	322	

Field evaluation

Analytics

View fieldplan (evaluation)

Generate fieldplan

Generate sowing list

Generate rating list

Edit experiment

View experiments

Upload pictures

Import spreadsheet

Experiment code

2x300



**Thanks for your attention**