

GACS Core: Creation of the Global Agricultural Concept Scheme

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November 25, 2016

<http://agrisemantics.org/gacs/>

Partners

- Food and Agriculture Organization of the UN
- CAB International (UK)
- National Agricultural Library (US)



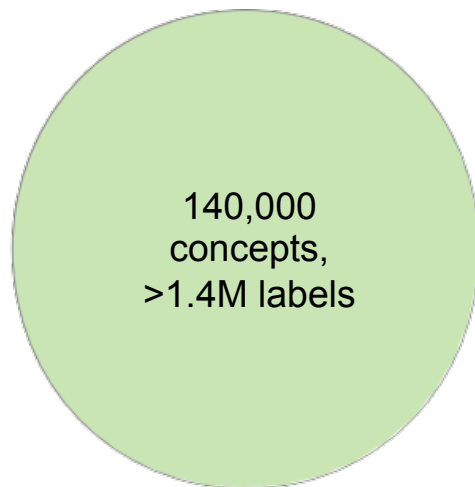
Three overlapping thesauri – *rice, aquaculture, plant pests...*

	Bibliographic database	Indexed records	Number of concepts	Coverage	Format
CABI Thesaurus (CABT)	CAB Abstracts	8.3 million	264,500 terms with about 206,400 plant, animal and microorganism names Multilingual in 10 languages	Pure and applied life sciences, technology and social sciences	
NALT	Agricola	5.2 million	> 120,610 terms English and Spanish	In depth coverage of agriculture, biology and related disciplines.	Linked Open Data: XML, RDF-SKOS, PDF, MARC and DOC
AGROVOC	AGRIS	8 million	> 32,000 concepts available in 23 languages	All areas of interest of FAO, including food, nutrition, agriculture, fisheries, forestry, environment etc.	Linked Open Data, SKOS-XL



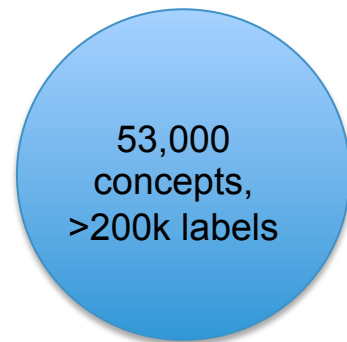
AGROVOC

English, Spanish,
Portuguese, German,
Czech, Persian, Polish,
Hindi, French, Italian,
Russian, Japanese,
Hungarian, Chinese,
Slovak, Thai, Lao, Turkish,
Korean, Arabic, Telugu ...



CAB Thesaurus

English, Spanish, Portuguese,
Dutch + others



NAL Thesaurus

English, Spanish

Motivation

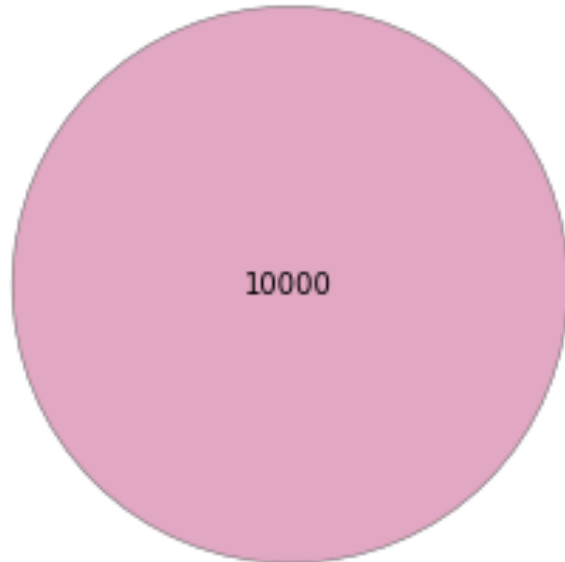
- To improve the **semantic interoperability** of thesauri maintained by FAO, CABI, and NAL
- To provide **core concepts** broadly supported across the three thesauri
- “Open data needs common semantics for linking diverse information” (G8)

How

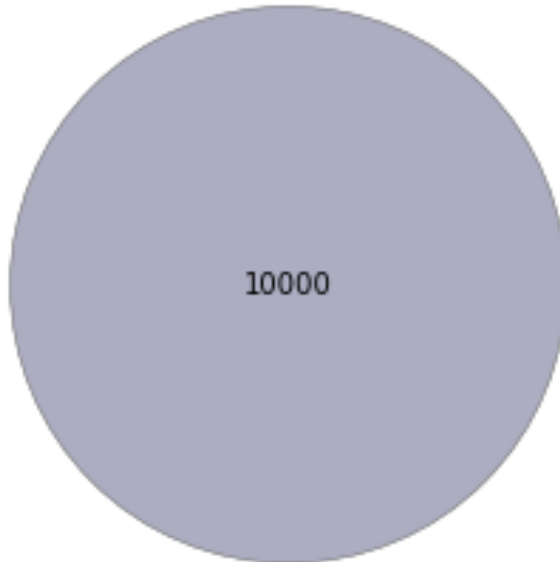
1. Take the 10,000 most-used concepts from each

October 2014

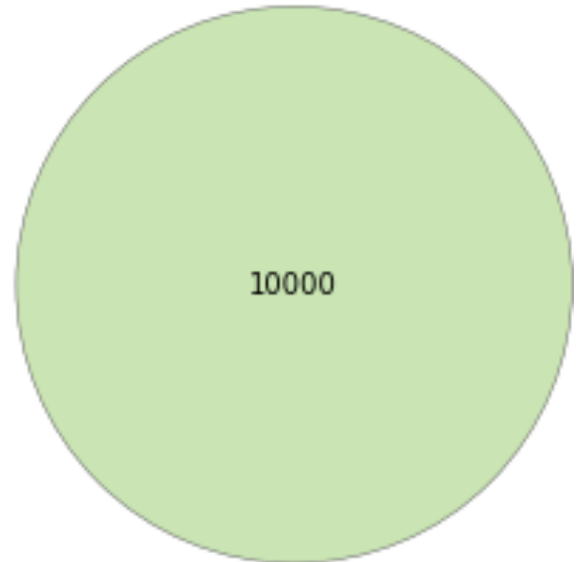
Before mapping



AGROVOC (10000)



NALT (10000)

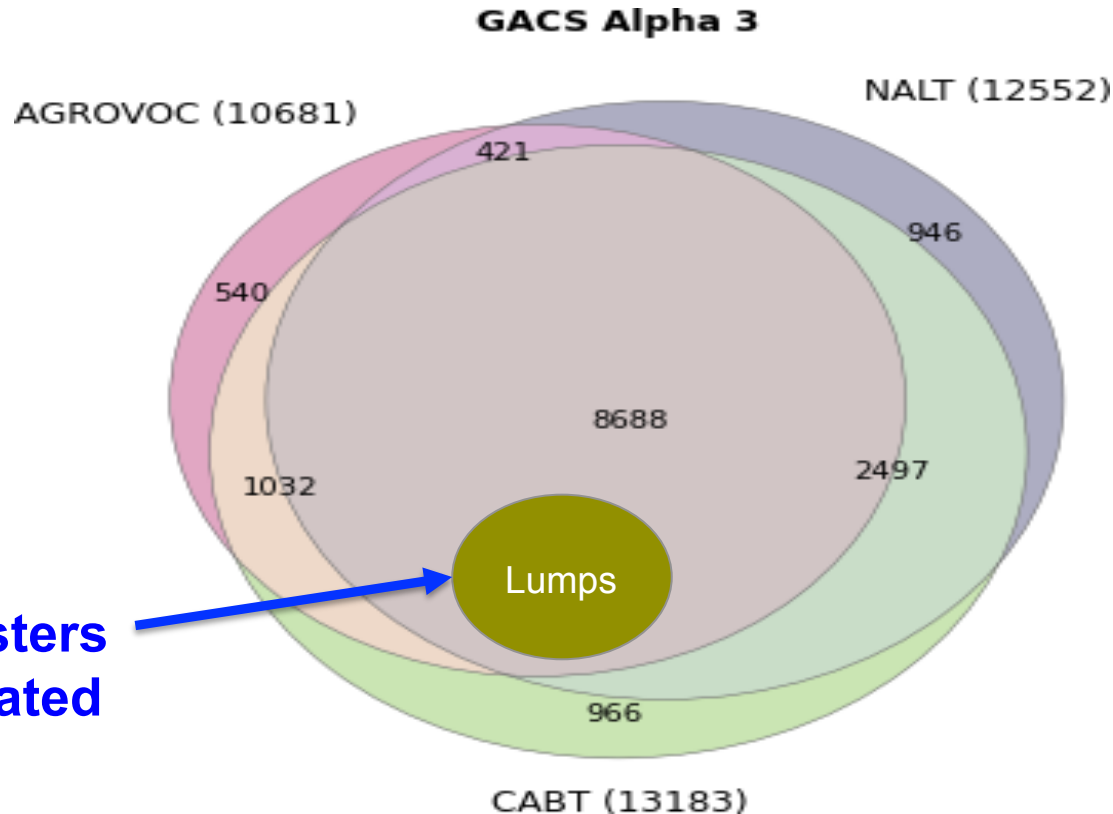


CABT (10000)

How

2. Automatically map them to each other

March 2015

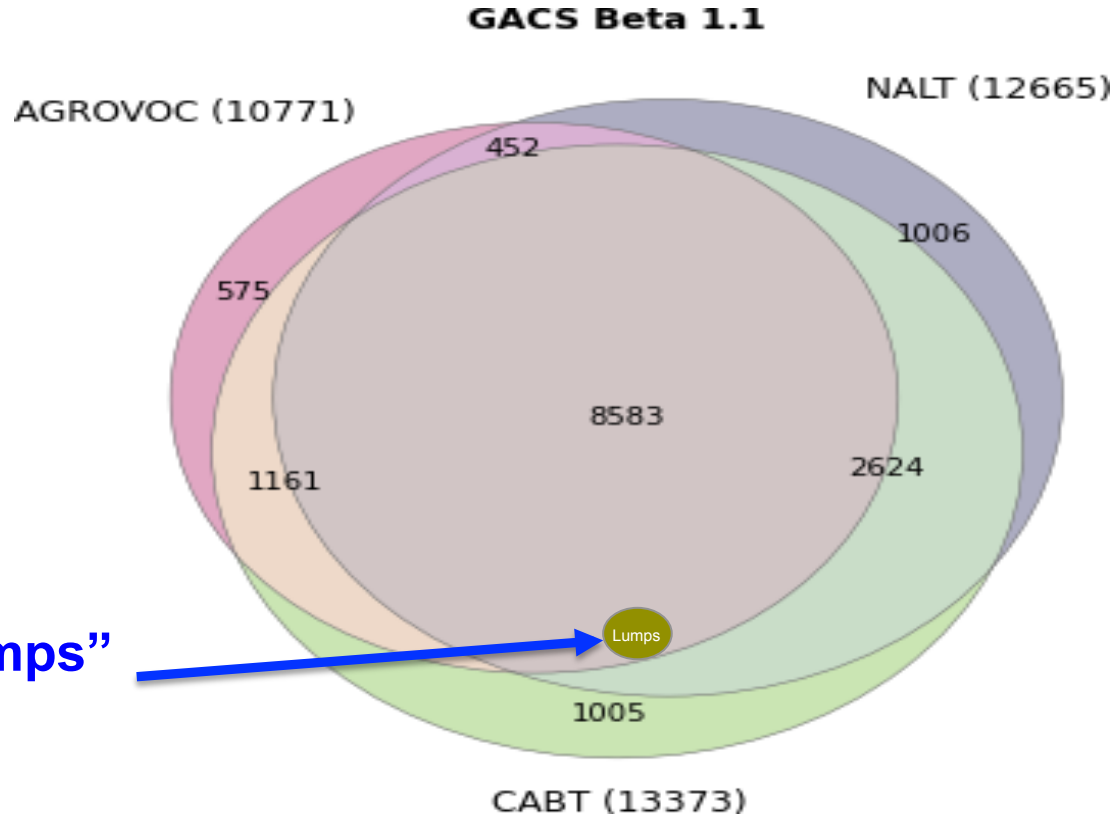


**Awkwardly
mapped clusters
were anticipated**

How

3. Verify mappings, one by one

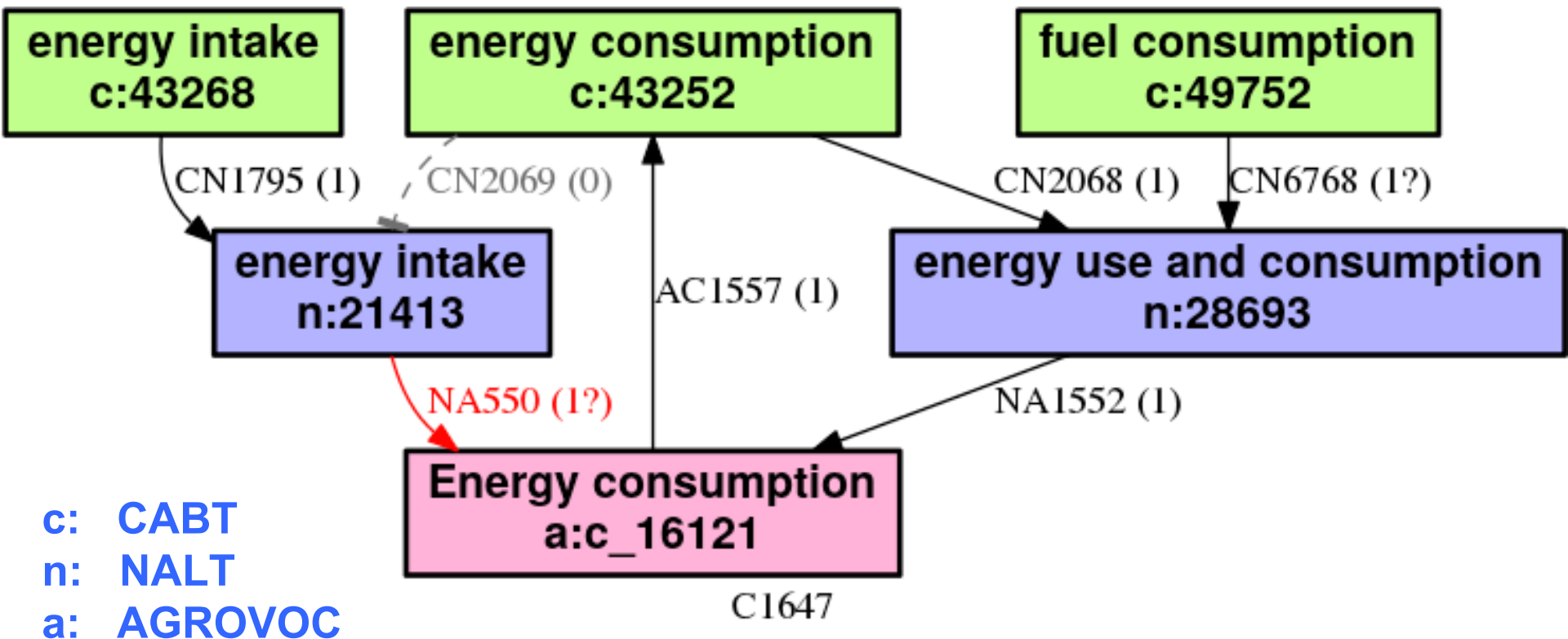
October 2015



Resolve “lumps”
on telecons

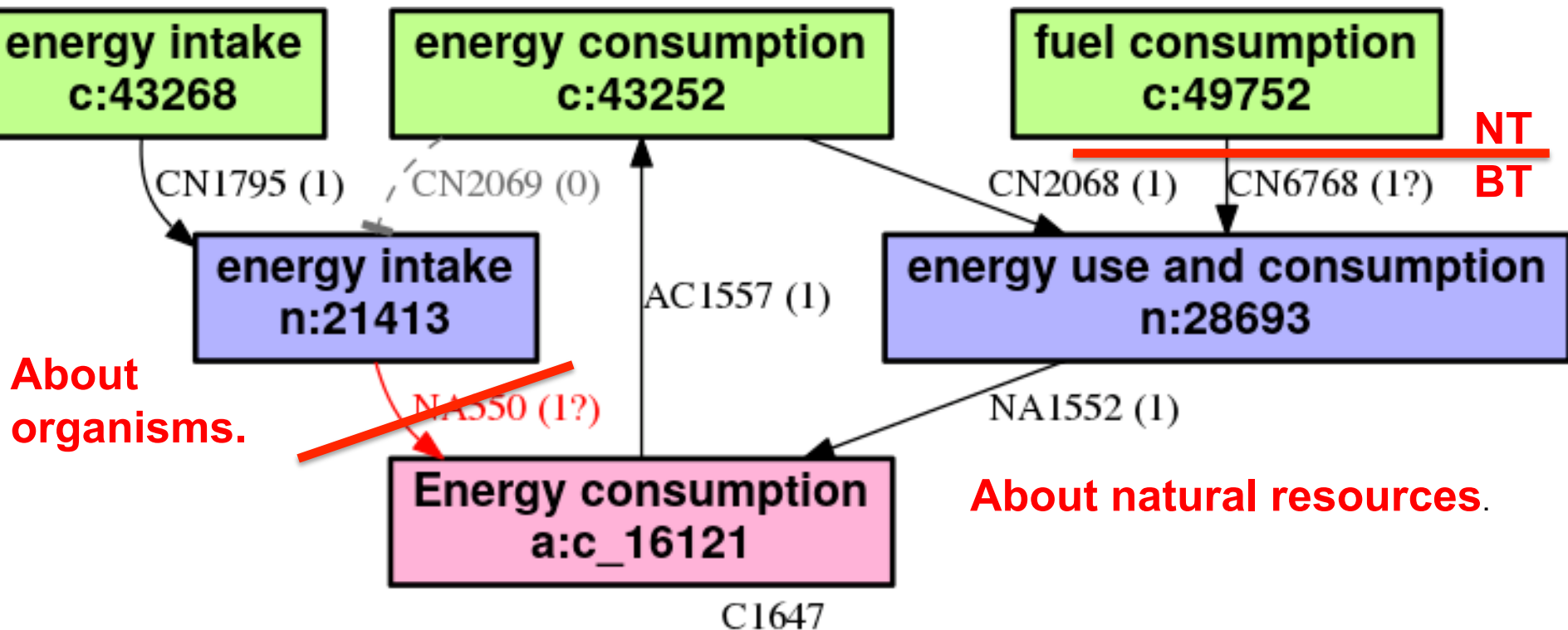
Example Lump

Six concepts

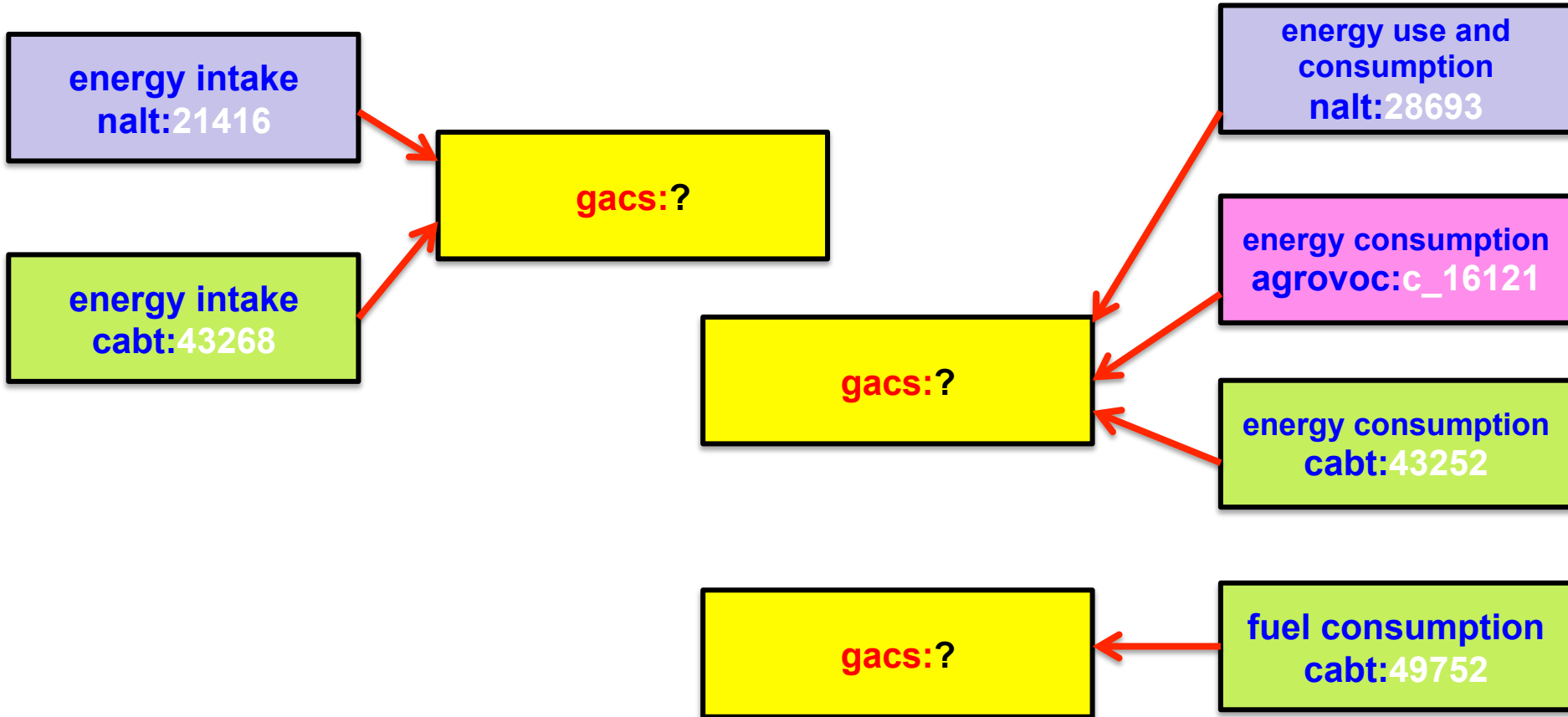


Example Lump

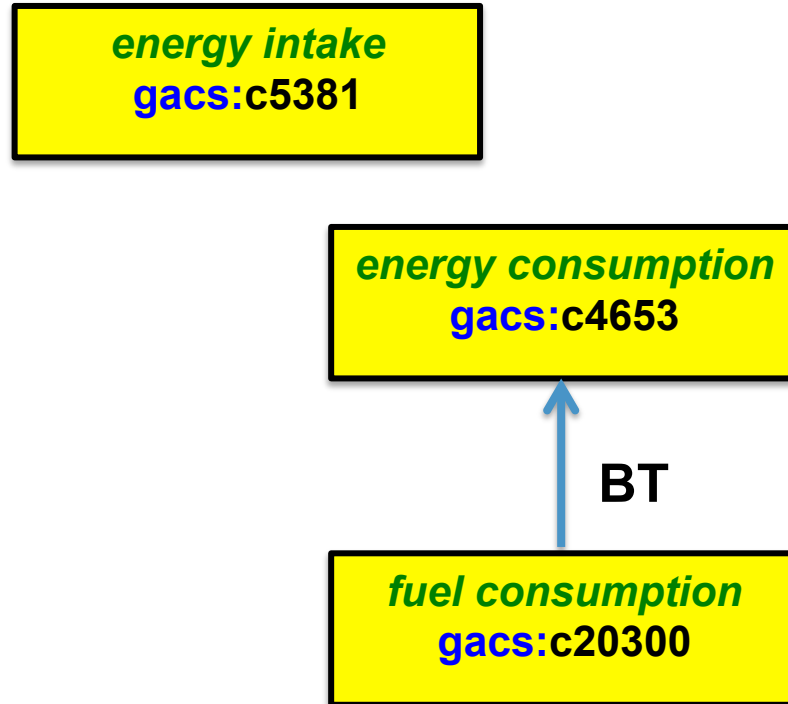
Mappings fixed



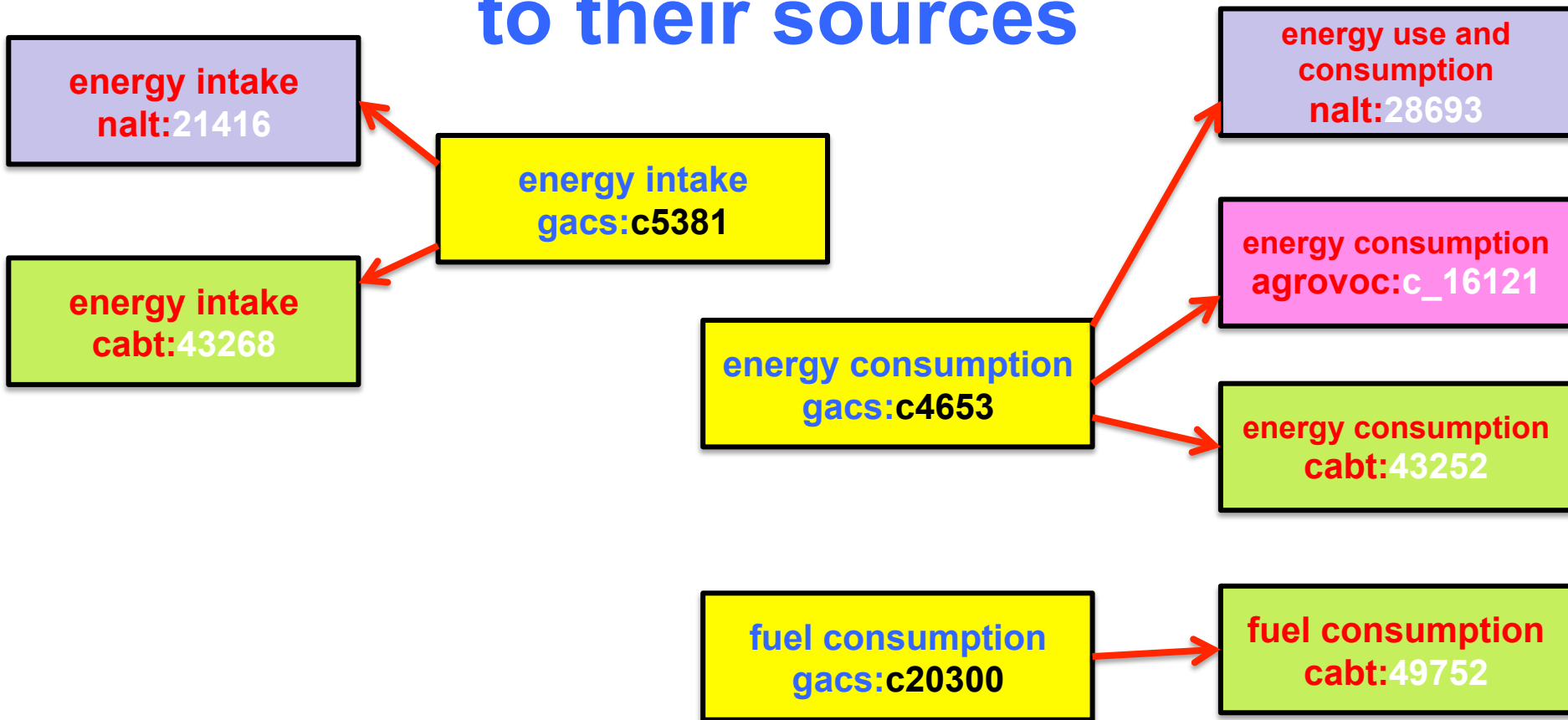
Used to create



...three concepts in GACS Core

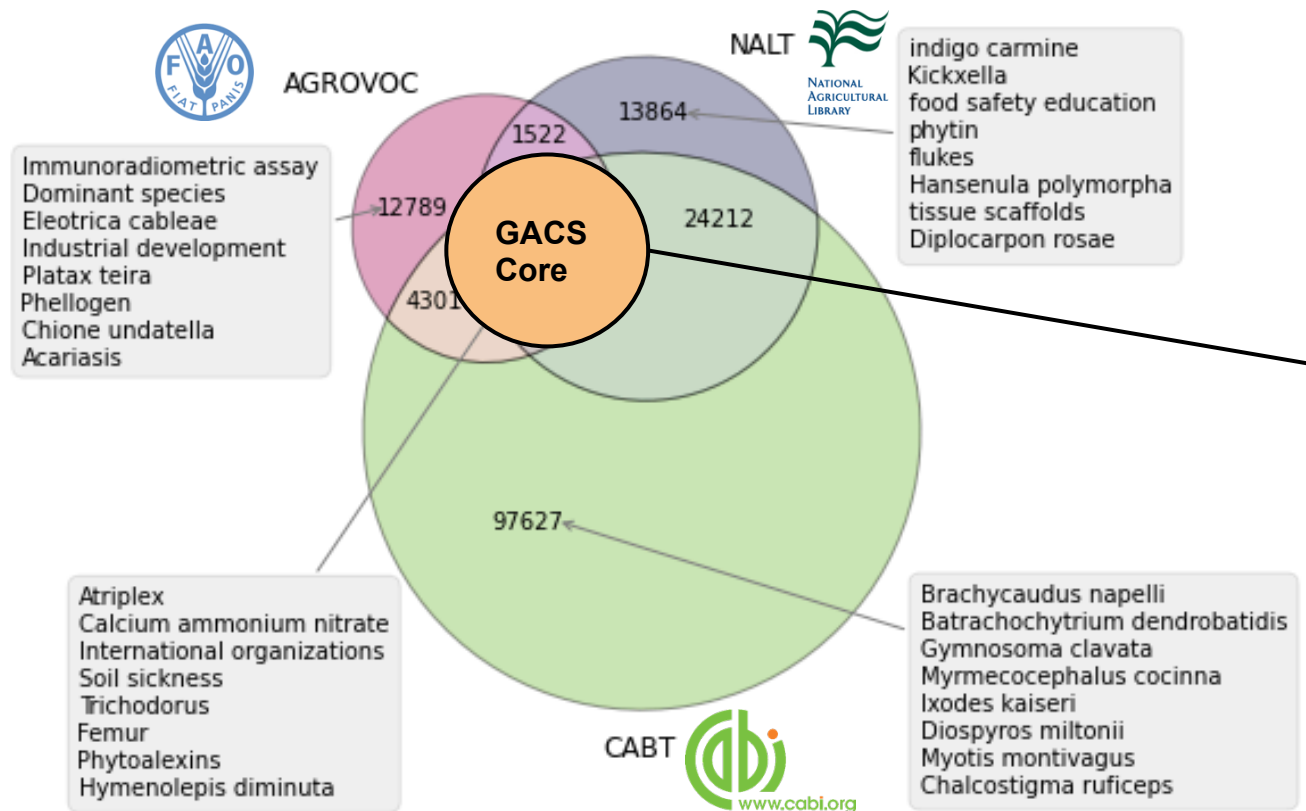


...which map back
to their sources



Global Agricultural Concept Scheme

May 2016



GACS Core Beta 3.1

- 15,000+ concepts
- 350,000+ labels in 29 languages
- definitions, relations, and multilingual labels from three sources

Semantic structure of GACS Beta

- Semantic relations
 - broader, narrower, related, exactMatch (mapping)
 - hasProduct/productOf to relate fish (organism) to fish (product)
- Semantic types
 - Sub-classes of skos:Concept
 - Chemical, Geographical, Organism, Product, Topic (catch-all)
 - Note: hierarchical relations *not* currently used for typing
- Thematic Groups
 - Reused 1999 Classified CAB Thesaurus
 - Life Sciences > biology > microbiology > bacteriology

Position in hierarchy
Preferred label
Type of concept

Definition

Broader, narrower, and related concepts

Alternative labels

Belongs to group

Translated in up to 25 languages

URI

Download

Mapped to source thesauri

biology > organisms > hosts > host plants

host plants

TYPE
DEFINITION

Organism

Plantas que sirven de albergue, hábitat, sitios de crianza o fuente de alimentos como parte del ciclo vital de otros organismos.
Plants which are hosts for symbiont organisms, including those that are trophically associated with them (such as plant pathogens, plant parasites and phytophagous arthropods).
Plants which provide shelter, habitat, breeding sites or serve as a food source as part of the life cycle of another organism.

BROADER CONCEPT

hosts

plants (botany)

NARROWER CONCEPTS

food plants

weed hosts

RELATED CONCEPTS

plant parasites

plant pathogens

ALTERNATIVE LABEL

host crops

host plant

hosts of plant diseases

hosts of plant pests

plant host

plant hosts

BELONGS TO GROUP
LANGUAGES

organisms, by non-taxonomic groups

نباتات عائله

Arabic

寄主植物

Chinese

hostitelské rostliny

Czech

waardplanten

Dutch

Plante hôte

French

Wirtspflanze

German

परपोषी पौधे

Hindi

gazdanövény

Hungarian

Piante ospiti

Italian

宿主植物

Japanese

기주식물

Korean

မိသားစု

Lao

گیاهان میزبان

Persian

Roślina żywicielska

Polish

plantas hospedeiras

Portuguese

Planta hospedeira

растения-хозяева

Russian

hostiteľské rastliny

Slovak

plantas huéspedes

Spanish

plantas hospedantes

అతిథియ మొక్కలు

Telugu

พืชอาศัย

Thai

konukçu bitki

Turkish

рослини-хазяї

Ukrainian

<http://id.agrisemantics.org/gacs/C1029>

RDF/XML TURTLE JSON-LD

EXACT MATCH

host plants
host plants
host plants

AGROVOC
CAB Thesaurus
NAL Thesaurus

GACS Core **Beta**

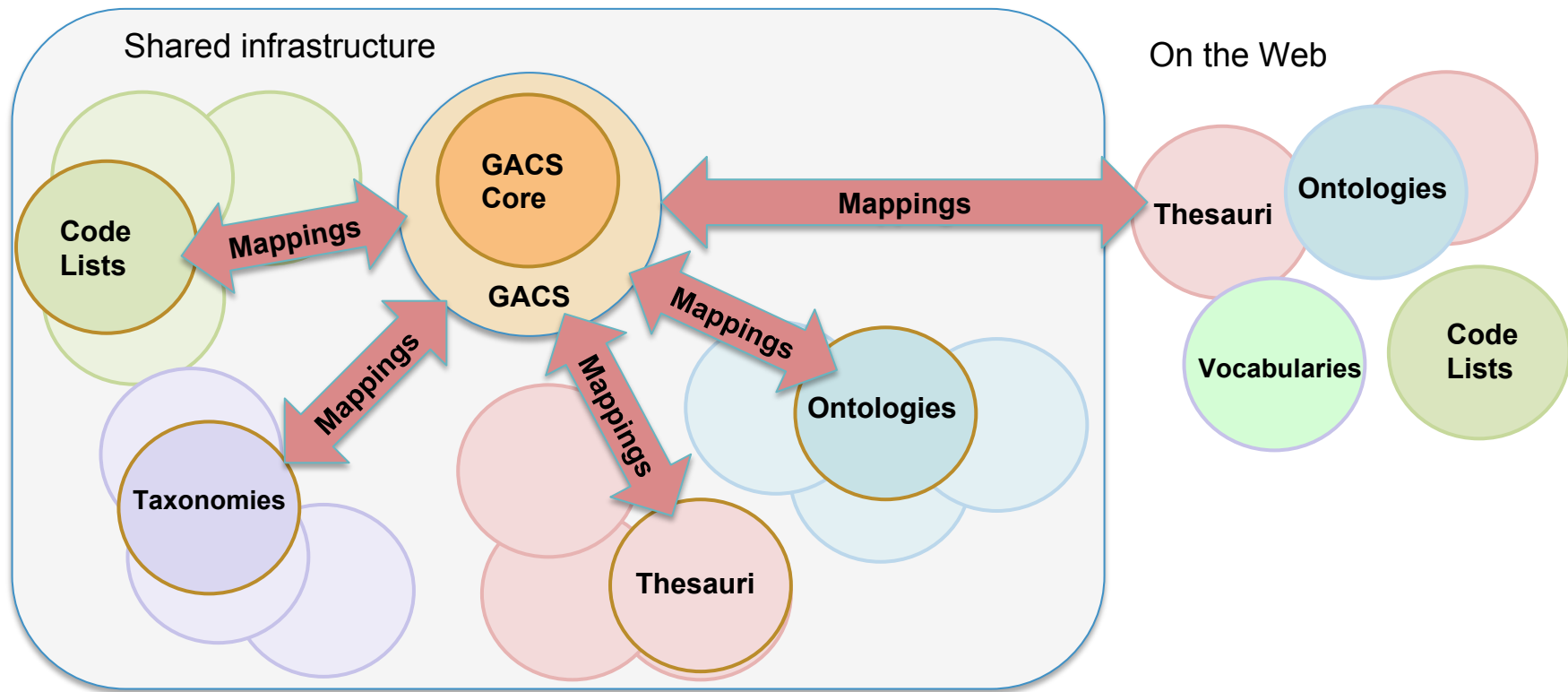
- Concepts considered **reasonably stable**
- **URIs** not *expected* to change, but may
- Some **quality issues** fixed but work remains
- Next: design and **fix a coherent hierarchy**
- **Testing** is encouraged
- **Feedback** welcome!

<http://agrisemantics.org/gacs/>

GACS vision

- **GACS as a hub** linking user-oriented thesauri with semantically more precise domain ontologies.
- **Domain ontologies, in turn, link to datasets** in order to make that data more interoperable and reusable.
- GACS is seen as the first step towards improving the **coherence and interoperability** of agricultural data.

Agrisemantics



'Grain' in Agrovoc

Mappings support mash-ups

grain

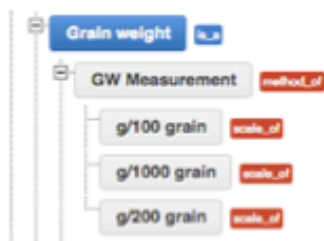
↳ plant products

↳ coarse grains

حب (ar), 谷类 (zh), zrno (cs), Grain (fr), Korn (de), अनाज/दाना (hi), gabonaszem (hu), Granelia (it), 穀物 (ja), 낱알 (ko), မြေထဲကစား (lo), Bijian (ms), غله (fa), Ziarno (pl), Grão (pt), зерно (ru), zrno (sk), Granos (es), เมล็ดธัญพืช (th), taneliler (tr), hububat (tr)

http://aims.fao.org/aos/agrovoc/c_3346

'Grain weight' in Crop Ontology with methods and units of measurement



Trait description Grain weight usually expressed as weight of single, one hundred, two hundred or thousand grains.

'fruit weight' in Trait Ontology

▼ TO:0002746 fruit weight

1 TO:0000590 grain weight

1 TO:0000919 kernel weight

1 CO_339:0000135 Pod weight


Agris abstracts indexed using the term 'grain weight'

AGRIS SEARCH

Search Results

[Get Classical View >](#)

Query : grain weight

 copy URL Results 1 - 10 of 356,043



Refine your search

< first < prev next >

Page 1 of 35604



Correlation and path coefficient analysis in bread wheat under drought stress and normal conditions [jan2000]

Subhani, G.M.

Abstract:

This paper describes the association, direct and indirect effects of morphological traits under drought stress and irrigated conditions. Significant mean squares among crosses were obtained for all characters under irrigation as well as drought stress. Positive and significant correlation were observed between grain yield per plant and flag leaf area, specific flag leaf weight, tillers per plant ...



Genotypic competition among elite wheat breeding lines under irrigated and rainfed conditions [2012]

Khan, A. ; Mohammad, F. ; Hassan, G. ; Khalil, I.H.

Abstract:

Development of high yielding cultivars is one of the prime objectives of all wheat breeding programs. An experiment was conducted during 2008-09 at Agriculture Research Farm, Khyber Pukhtunkhwa Agricultural University, Peshawar, Pakistan in which fifteen wheat lines were evaluated for yield and yield contributing traits under irrigated and rainfed field conditions. Lines exhibited significant ...



Effects of all straw returned to the field on grain number and grain weight at different spikelets and grain positions in winter wheat [may.2011]

Bibliographic
abstracts

CIMMYT Research Data Dataverse

18TH SEMI-ARID WHEAT YIELD TRIAL

hdl:11529/10170


Version: 2- Released: Mon Sep 14 06:43:43 CDT 2015

CATALOGING INFORMATION

[Data & Analysis](#)

[Comments](#)

[Versions](#)

 If you use these data, please add the following citation to your scholarly references. [Why cite?](#)

Data Citation

Singh, Ravi; Payne, Thomas, 2010, "18th Semi-Arid Wheat Yield Trial",
<https://hdl.handle.net/11529/10170> International Maize and Wheat Improvement Center
[Distributor] V2 [Version]

Citation Format [Print](#) 

Publications

18th SAWYT

Data Citation Details

Subtitle	18th SAWYT Cycle 2010
Study Global ID	hdl:11529/10170
Authors	Singh, Ravi (CIMMYT); Payne, Thomas (CIMMYT)
Distributor	International Maize and Wheat Improvement Center (CIMMYT)

Research
data

Data files

Trial name	Occ	Loc_no	Country	Loc_desc	Cycle	Cid	Sid	Gen_name	Trait	Trait name	Gen_no	Rep	Sub_block	Plot	Value	Unit
18TH SEMI-ARID WHEAT YT	1	61702	SERBIA	RINSKI SANCEVI	2010	61665	1	LOCAL CHECK	147	1000_GRAIN_WEIGHT	1	1	1	1	31.5	g
18TH SEMI-ARID WHEAT YT	1	61702	SERBIA	RINSKI SANCEVI	2010	95758	12	DHARWAR DRY	147	1000_GRAIN_WEIGHT	2	1	1	2	27.1	g
18TH SEMI-ARID WHEAT YT	1	61702	SERBIA	RINSKI SANCEVI	2010	24762	30	CHAM 6	147	1000_GRAIN_WEIGHT	3	1	1	3	24.1	g
18TH SEMI-ARID WHEAT YT	1	61702	SERBIA	RINSKI SANCEVI	2010	462733	42	HSB 1313/2*WBLL1	147	1000_GRAIN_WEIGHT	21	1	3	21	26.5	g
18TH SEMI-ARID WHEAT YT	1	61702	SERBIA	RINSKI SANCEVI	2010	479309	345	SOKOLL/EXCALIBUR	147	1000_GRAIN_WEIGHT	23	1	3	23	31.8	g
18TH SEMI-ARID WHEAT YT	1	61702	SERBIA	RINSKI SANCEVI	2010	485682	62	PI 610750/LANG	147	1000_GRAIN_WEIGHT	25	1	3	25	25.5	g
18TH SEMI-ARID WHEAT YT	1	61702	SERBIA	RINSKI SANCEVI	2010	485792	55	ALTAR 84/AE.SQUARROSA (219)	147	1000_GRAIN_WEIGHT	26	1	3	26	24.5	g
18TH SEMI-ARID WHEAT YT	1	61702	SERBIA	RINSKI SANCEVI	2010	485792	56	ALTAR 84/AE.SQUARROSA (219)	147	1000_GRAIN_WEIGHT	27	1	3	27	27.4	g
18TH SEMI-ARID WHEAT YT	1	61702	SERBIA	RINSKI SANCEVI	2010	485834	26	SOKOLL//SUNCO/2*PASTOR	147	1000_GRAIN_WEIGHT	28	1	3	28	28.5	g

Goals

- **Open-access** semantics are easy to re-use.
- Make agricultural **data easier to re-use**.
- Through mapping, **promote cooperation** and **reduce duplication**.
- Coherent semantics benefit **research, innovation systems, and value chains**.

<http://agrisemantics.org/gacs/>