

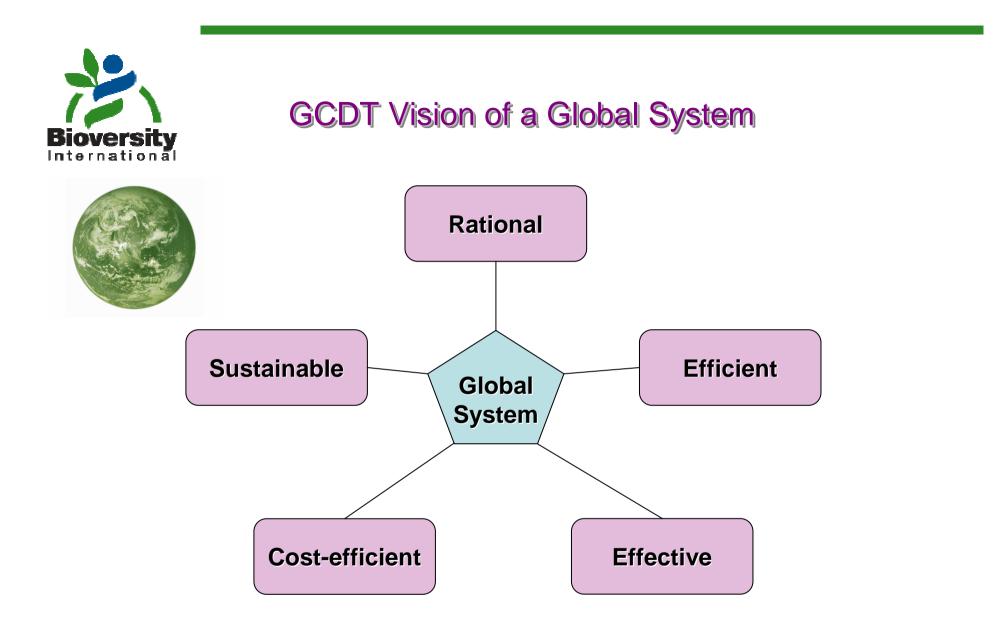
Options for managing characterization and evaluation data

Bonn, 7 May 2009

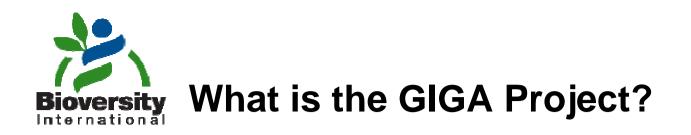
Michael Mackay



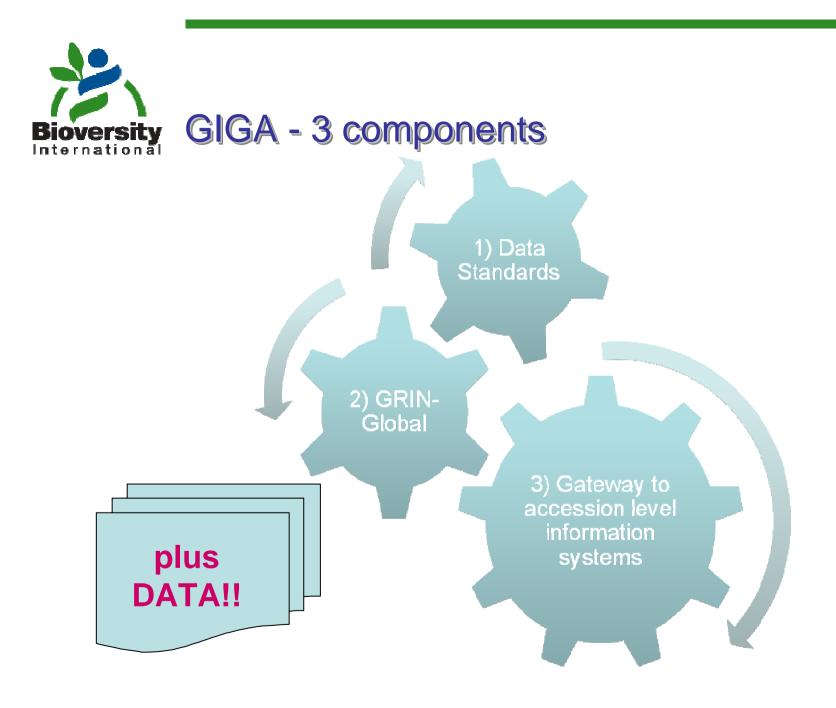
• Partnership between GCDT, ITPGRFA & Bioversity to support the global system.



Based on a slide by Cary Fowler



- Partnership between GCDT, ITPGRFA & Bioversity to support the global system.
- Three components:
 - Data Standards
 - GRIN-Global
 - Accession level information portal to > 2M accessions
- Compliant with MLS and SMTA.
- Delivery by April 2011.





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- Passport data been around for long time
- This data alone is not so useful to facilitate utilization
 - 50 year history, no exploitation methods had real impact
 - GCDT Crop Strategies etc



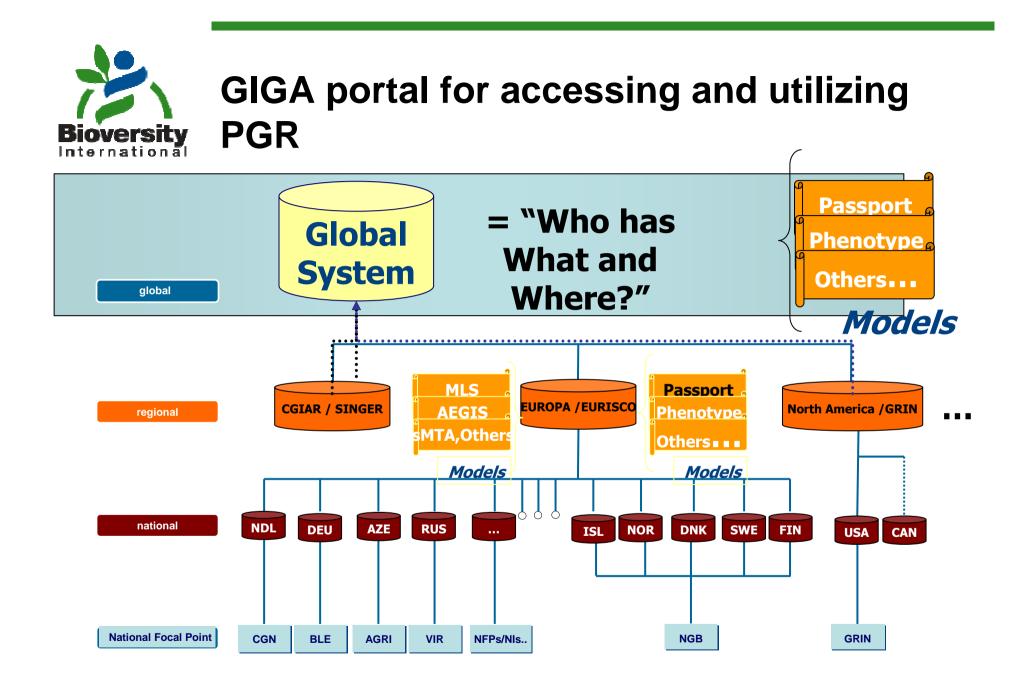
So what's the problem?

Improving conservation Improving data

Improving use: Choosing the right samples for your needs

Vavilov (1957) emphasizes need to select correct 'starting material' for crop improvement.

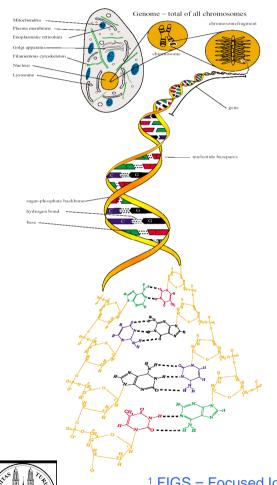
Courtesy: R Sackville-Hamilton





 Combinations of passport, characterization, evaluation and environmental data allowed selection of right accessions to double the number of known functional alleles for *Pm3* locus in just two years.

Example of Impact : Allele mining



Bioversity

- 16,000 bread wheat landraces
- 1,300 chosen using FIGS¹ method (Passport + evaluation + GIS + environment data)
- Phenotyping showed 211 accessions either R or IR
- For *Pm3*: ²
 - 100 years classic genetics = 7 alleles
 - FIGS + MoBo + 2 years = 7 new alleles
 - At least two have new race specificity

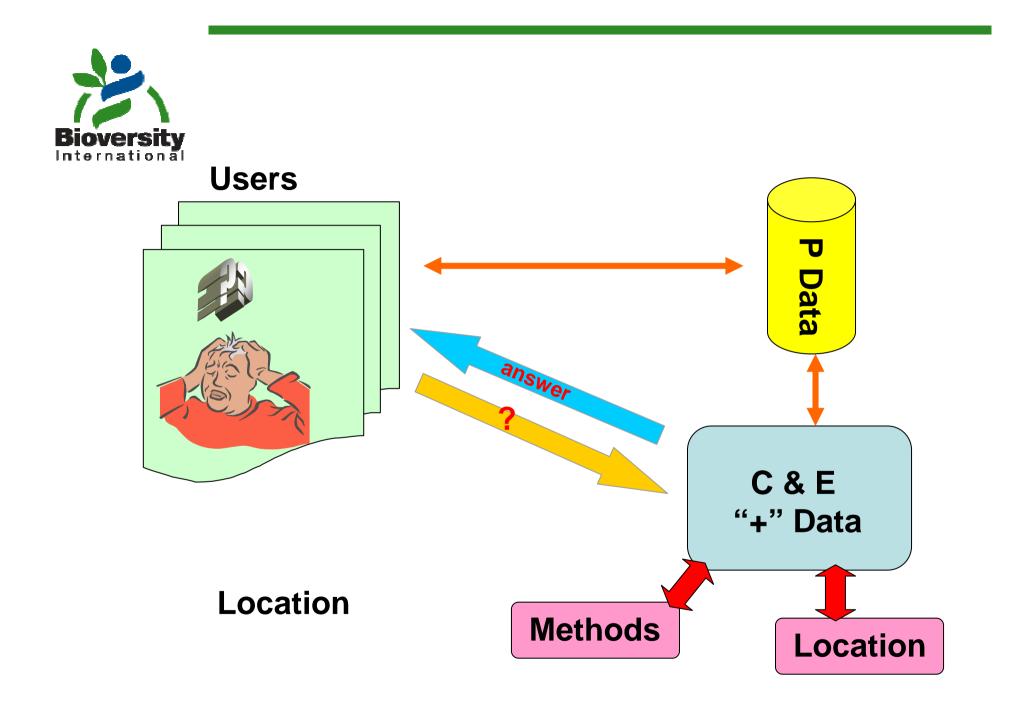
¹ FIGS = Focused Identification of Germplasm Strategy (various, incl. Mackay *et al*, manuscript in preparation)





- Who will use this type of data?
 - Policy maker
 - Bureaucrat
 - Student
 - Scientist

• Make sure we focus on who the user is, what the user wants and then provide appropriate functionality.

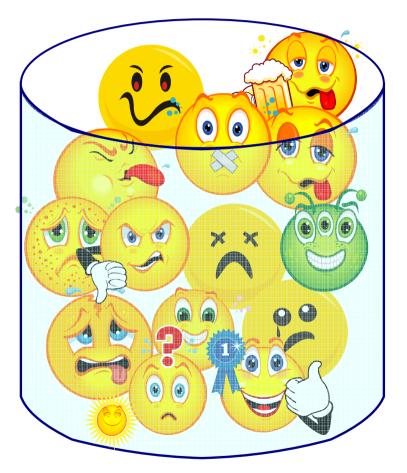




Scientist wants a few hundred accessions to evaluate for a particular trait



How does the scientist select a small subset likely to have the trait?



6 million accessions in 1500 gene banks



- Considered difficult to add C & E data, but GRIN & ICIS have been doing for some time.
- Difficulty not so much in storing data, but more in getting, managing & facilitating its use.
 - Need a method of accepting any data contributed
 - Need to link "families" of data. E.g. All drought related evaluation data, despite different methods, approaches etc
 - PGR users need to easily find the data they seek
 - Possible solutions....

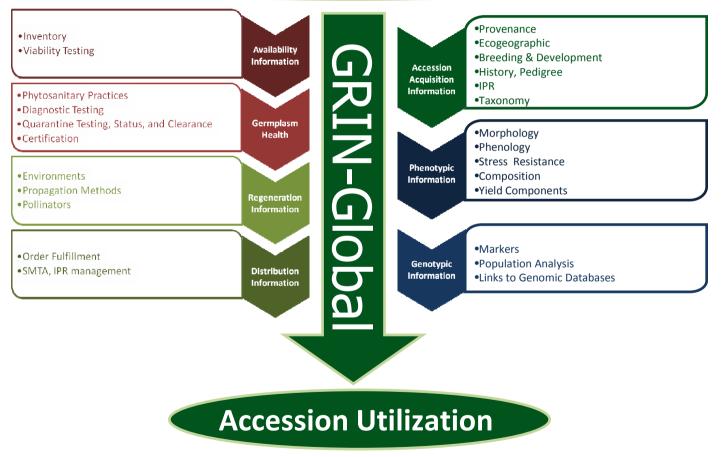


- Environmental data for any geo-referenced accessions
 - FIGS approach offers 60+ environmental parameters
- Visualization through mapping, download to Google Earth etc



Another option to consider...

Plant Genebank Collection and Information Management





Developing these approaches including options for:

- Uploading data
- Web services tools
- Flexible genebank management software with built-in client, network and web functionality
- Opportunity for ECPGR etc to take advantage of these developments



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	SVR002	7114	Cicer arietinum	Unknown		Afghanistan		
	SVR002	74098	Cicer arietinum	Unknown		Afghanistan		
	SVR002	74099	Cicer arietinum	Unknown		Afghanistan		
	SVR002	74702	Cicer arietinum	Unknown		Afghanistan		
	SVR002	74703	Cicer arietinum	Unknown		Afghanistan		
	SVR002	74704	Cicer arietinum	Unknown		Afghanistan		
	SYR002	74705	Cicer arietinum	Unknown		Afghanistan		
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Isothermality (P2/P7) 0.33 Annual Precipitation 322 Temperature Seasonality (standard deviation) 100.01 Precipitation of Wettest Month 67	Environment Longitude: 67 Minimum te Maximum te Precipitatio	7.11669921875 Igan. Igan. -21.4 Igan. -21.4 Igan. -7.5 Igan.5 Igan. -7.5 Igan	Latitude: Feb. -17.5 -5.1	33,6666 Mar. -9,5 1,7	9845581 Apr. -3,1 9	May. 0.5 15.2 29	Jun. 5.1 22.4 3	6.6 24.6 2	5.2 24.1 0	Sep. 0 20.2 2	Oct. -4.9 12.4 17	Nov. -9.9 5.1 19	Dec. -16 -1.3 36	-5.41
Temperature Seasonality (standard deviation) 100.01 Precipitation of Wettest Month 67	Environment Longitude: 67 Minimum te Maximum te Precipitatio Annual Mea	7.11669921875 mperature -21.4 emperature -7.5 m 33 sn Temperature	Latitude: Feb. -17.5 -5.1 67	33.6666 Mar. -9.5 1.7 51	9845581 Apr. -3.1 9 63	Мау. 0,5 15,2 29 2,3	Jun. 5.1 22.4 3	6.6 24.6 2	5.2 24.1 0	Sep. 0 20.2 2	Oct. -4.9 12.4 17	Nov. -9.9 5.1 19	Dec. -16 -1.3 36	-5.41 10.07
Description of Direct Month O	Environment Longitude: 67 Minimum te Maximum te Precipitatio Annual Mea Mean Dium	7.11669921875 mperature -21,4 emperature -7.5 on 33 an Temperature al Range (Mean of mo	Latitude: Feb. -17.5 -5.1 67	33.6666 Mar. -9.5 1.7 51	9845581 Apr. -3.1 9 63	May. 0.5 15.2 29 2.3 15.5	Jun. 5,1 22,4 3 Mean Te	6.6 24.6 2 mperature	5.2 24.1 0 e of Colde	Sep. 0 20.2 2	Oct. -4.9 12.4 17	Nov. -9.9 5.1 19 -11.	Dec. -16 -1.3 36	-5.41 10.07
	Environment Longitude: 63 Minimum te Maximum te Precipitatio Annual Mea Mean Diurn Isothermal	7.11669921875 mperature -21,4 emperature -7.5 on 33 an Temperature al Range (Mean of mo ity (P2/P7)	Latitude: Feb. -17.5 -5.1 67 onthly (max	33.6666 Mar. -9.5 1.7 51 t temp - n	9845581 Apr. -3.1 9 63	May. 0.5 15.2 29 2.3 15.5 0.33	Jun. 5.1 22:4 3 Mean Te Annual	6.6 24.6 2 mperature Precipitat	5.2 24.1 O e of Colde ion	Sep. 0 20.2 2 st Quarte	Oct. -4.9 12.4 17	Nov. -9.9 5.1 19 -11. 322	Dec. -16 -1.3 36	-5.41 10.07











Core GIGA team

- Adriana Alercia
- Frederick Atieno (SSA)
- Sonia Dias
- Tito Franco (AMO)
- Fawzi Nawar
- Milko Skofic
- + 1 position in India