ICT METHODOLOGIES IN AGRICULTURAL EXTENSION SERVICE DELIVERY FOR IMPROVED YOUTH ENGAGEMENT IN AGRICULTURE

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INTRODUCTION

The prevailing revolution in Information and Communication Technology (ICT) presents us with a unique opportunity to harness its diverse innovations and applications to develop an efficient e-agriculture sector that is able to increase agricultural productivity to meet the food security of the world's increasing population.

It is in this regard that the Savannah Young Farmers Network (SYFN), a farmer based Non-governmental organization in Ghana is committed to innovatively integrating ICT applications into its Agricultural Development initiatives.

This is aimed at promoting the active engagement of the youth in Agriculture to increase Agricultural productivity and improve food security in Ghana. This presentation therefore highlights the implementation of the Audio Conferencing for Agricultural Extension (ACE) project in Northern Ghana.

ICT METHODOLOGIES FOR AGRICULTURAL ADVISORY SERVICE TO YOUNG FARMERS

The diverse applications and innovations in ICT coupled with the ingenuity of the youth in adopting ICT innovations, provides Agricultural Advisory service professionals a platform to innovatively develop ICT driven methodologies that are able to attract the interest of the youth to take up Agriculture as a sustainable livelihood.

This will contribute significantly in developing their capacity to establish Agric-enterprises across the Agricultural value chain to curtail the increasing youth unemployment.

The Savannah Young Farmers Network (SYFN) therefore innovatively utilizes mobile applications such as: Audio Conferencing, M-Radio, M-Insurance, M-Banking, M-Market etc to introduce young farmers to e-Agriculture for increased Agricultural productivity and enhance food security.

The Implementation of ICT driven Agricultural development projects by the Savannah Young Farmers Network (SYFN) is contributing significantly to promote the active engagement of the youth in Agriculture.

THE AUDIO CONFERENCING FOR AGRICULTURAL EXTENSION SERVICE (ACE) PROJECT

The Savannah Young Farmers Network (SYFN) has innovatively employed Audio Conferencing Mobile Application for the delivery of demand driven and participatory Agricultural extension service to farmers and other Agricultural value chain actors in Northern Ghana.

The innovation requires a mobile phone, the activation of an Audio Conferencing Application and a portable loud speaker.

The Agricultural Advisory service is provided by Agricultural Extension Officers in partnership with Agricultural researchers. The delivery of the Agricultural Advisory service at the community level is assisted by trained Community Agricultural Information Agents (CAI's).

The project's innovation benefits farmers with a farmer group size of 10-15 in order to enable them drive the needed benefit. The Agricultural Advisory service is delivered regularly to farmers who also have the opportunity to schedule additional Advisory service times to further enhance the buildup of their capacity on various issues relevant in increasing their productivity.

OBJECTIVES OF THE AUDIO CONFERENCING FOR AGRICULTURAL EXTENSION SERVICE (ACE) PROJECT

The objectives of the Audio Conferencing for Agricultural Extension Service (ACE) project are:

- Introduce and support farmers adopt ICT applications for enhanced access to demand driven and participatory Agricultural Advisory Service.
- Strengthen farmer's access to demand driven and participatory Agricultural Advisory Service.
- Promote the Active engagement of the youth in Agriculture.
- Increase farmer's productivity for sustainable food security across the Savannah Ecological belt of Ghana and the nation at large.

RESULTS OF THE AUDIO CONFERENCING FOR AGRICULTURAL EXTENSION SERVICE (ACE) PROJECT FOR THE 2011-2012 FARMING SEASON

The results outlined below highlights the Adoption of the Innovation by farmers in various communities across the three northern regions of Ghana. The innovation is used to offer demand driven and participatory Agricultural Advisory service to farmers with a farmer group size of 10-15 to ensure the effectiveness of the service. The 2011-2012 farming season benefited a total of 50 farming communities, 102 farmer groups and a total of 1,085 farmers.

ADOPOTION OF THE AUDIO CONFERENCING INNOVATION DURING THE 2011-2012 FARMING SEASON

The table below indicates the level of Adoption of the Audio Conferencing Technology by farmers in various communities across the three northern regions of Ghana. The innovation is used to offer demand driven and participatory Agricultural Advisory service to farmers with a farmer group size of 10-15 to ensure the effectiveness of the service. The 2011-2012 farming season benefited a total of 50 farming communities, 102 farmer groups and a total of 1,085 farmers.

IMPACT OF THE AUDIO CONFERENCING INNOVATION ON THE PRODUCTIVITY OF FARMERS

The table below indicates the benefit of the Audio Conferencing for Agricultural Advisory Service on the productivity levels of farmers across the three northern regions of Ghana who produce Maize, Rice and Soya Beans. The benefits that farmers who adopt the Audio Conferencing for Agricultural Advisory Service receive are: +3.0, +1.6 and +2.0 Metric tons per hectare for Maize, Rice and Soya Beans respectively.

CONCLUSIONS

- ICT methodologies for Agricultural Extension Delivery can significantly improve upon the engagement of the youth in Agriculture.
- ICT methodologies for Agricultural Extension Delivery can significantly improve upon the productivity levels of farmers for sustainable food security.
- The use of ICT methodologies for Agricultural Advisory service significantly improves upon market access for farmers, and Agricultural value chain development for enhanced Agricultural profitable.
- ICT methodologies for Agricultural Advisory service strengthens the relationships between farmers, Agricultural Extension Officers and Agricultural Researchers for the delivery of demand driven and participatory Agricultural Extension service.
- Poor Mobile Network and Internet connectivity is a challenge to the implementation of the Audio Conferencing for Agricultural Extension Service and the use of ICT Methodologies for Agricultural Advisory Services.
Managing Research Data in Agricultural Research

Monday, July 22, 3:45-4:45pm
What is (are) data?

“Research data is recorded factual material commonly accepted in the scientific community as necessary to validate research findings”

“Data is a collection of facts, such as values or measurements. It can be numbers, words, measurements, observations or even just descriptions of things.”

So, data are facts... Do we believe them? Let’s look at some
Europe’s population (according to Eurostat)
What happened?
To be complete: Asia’s population according to Eurostat

So: data is meaningless without proper documentation at different levels (project, file, parameters)
Some concepts

- Research data can be "open data" but not necessarily
- Research data can be "Linked Open Data" but not necessarily
- Datasets can be stored temporarily in a repository
- Datasets can be stored for the longer term in an institutional repository or in a disciplinary repository

**Toto Agriculture**

*toto*, **adj.** (Latin) altogether, complete, universal.

*agriculture, n.** (English) the art or science of cultivating the ground, including the harvesting of crops, and the rearing and management of live stock, tillage, husbandry, farming.

**Aspirations**

- Mission: with a particular focus on the world’s rural citizens within developing economies, our mission is to share, in laymen’s terms, information on as broad an audience as possible, irrespective of language, ethnicity, occupation or income level.
Some concepts:

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- Research data can be "Linked Open Data" but not necessarily
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Some concepts

(Cabauw Experimental Site for Atmospheric Research) observatory in Cabauw, The Netherlands. This location has several advantages: In the first place, an increased sensitivity due to the reduction of the influence of ground clutter. Secondly, it allows direct observation of the horizontal distribution of low level clouds and fog. Finally, the presence of other instruments in the vicinity enhances the understanding of the physical processes in the atmosphere by synergistically combining their measurements. Data from other instruments at CESAR are available at http://www.cesar-database.nl.

IDRA provides the horizontal distribution of reflectivity, mean Doppler velocity, Doppler spectrum width and polarimetric parameters like differential reflectivity, linear depolarization ratio or specific differential phase. The data collected is freely available to the scientific community.

CESAR observatory, Cabauw (Lopik)

Map of this location [km]

Map including all data locations within 100 km [add-circle] [km]

Note: the extra points shown may be related to completely different types of datasets.

-0.7

Atmospheric observatory.

Lopik (municipality)

Utrecht (province)

IDRA weather radar measurements - day 2009-04-27
IDRA weather radar measurements - day 2009-04-28
IDRA weather radar measurements - day 2009-04-29
IDRA weather radar measurements - day 2009-04-30
IDRA weather radar measurements - day 2009-05-01
IDRA weather radar measurements - day 2009-05-02
IDRA weather radar measurements - day 2009-05-03
IDRA weather radar measurements - day 2009-05-04
IDRA weather radar measurements - day 2009-05-05
IDRA weather radar measurements - day 2009-05-06
IDRA weather radar measurements - day 2009-05-07
IDRA weather radar measurements - day 2009-05-08
Some concepts

- Research data can be "open data" but not necessarily
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Some more concepts

Collaboration, Publication, and the Curation Boundary

Collaboration Domain

- Collaboration Repository (e.g. Plone, Wiki)
- Data Repository (e.g. SRB)

- Contains document objects
- Contains data objects

- Identifier
- Descriptive Metadata
- Technical Metadata
- Digital Object

Publication Domain

- Public Document Repository (e.g. Fedora, DSpace, ePrints)

- Optional link from document to data

- Contains these objects

Migration Process

- Extract of large public dataset as basis for further collaborative research

- Contains these objects

* R = Register, H = Harvest, O = Obtain

Some more concepts

Some more concepts

Meet funder requirements for data management plans.
Some more concepts

Data needs to be curated for long-term storage and reuse. Research requires data management planning. Institutions are working at data management policies and it all starts with education.

Federal Funding Agencies: Data Management and Sharing Policies

The Office of Management and Budget (OMB) Circular A-110 provides the federal administrative requirements for grants and agreements with institutions of higher education, hospitals, and other non-profit organizations. In 1999 Circular A-110 was revised to provide public access under some circumstances to research data through the Freedom of Information Act (FOIA).

Funding agencies have implemented the OMB requirement in various ways. The table below summarizes the data management and sharing requirements of primary US federal funding agencies.

<table>
<thead>
<tr>
<th>US Federal Funding Agency</th>
<th>Policy and Guideline Status</th>
<th>More information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Energy (DOE)</td>
<td>DOE's CIO has primary responsibility to ensure that information Technology (IT) is acquired and information resources are managed in a manner consistent with statutory, regulatory, and Departmental requirements and priorities. With this responsibility, the CIO provides information resource management advice and</td>
<td><a href="#">DOE Policies</a>, <a href="#">Standard Research Terms and Conditions</a>, <a href="#">ARM Data Sharing and Distribution Policy</a>, <a href="#">Management of OSTI INI: Electronic Data</a></td>
</tr>
</tbody>
</table>
Some more concepts

The Research Data Management Training, or MANTRA project has produced an open, online training course to help disseminate good practice in research data management at the University of Edinburgh and beyond. It was formally launched at a meeting of the Applied Quantitative Methods Network this week.

What is it?

It is a non-credit, free online course which provides guidelines for good practice in research data management. It consists of interactive online units focused on key concepts of data management. They include video clips featuring senior academics talking about data management challenges. In addition there are practical exercises in handling data within four software analysis environments (SPSS, NVivo, R and ArcGIS), which learners can download and work through at their own pace.

Who is it for?

It is for PhD students, early career researchers, and all others who are planning a research project based on digital data. The course is an Open Educational Resource that may be freely used by anyone. It is available through an open license for
And finally
What we’ll discuss

• **Planning** Research Data Management (RDM)
• **Finding** data (from research and for research)
• What is the role of **librarians**?
• Some agricultural data **workflows**

See http://iaald2013rdm.pbworks.com
Some agricultural data workflows
the repository model
Omics (genomics, proteonomics, transcriptonomics, etc)
Economics micro

“Macro did not fit in the repository model

discovery, harvesting

Aggregators

Data analysis, transformation, mining, modeling

deposit, self archiving

Repositories

Research and e-science

Data creation, capture and gathering, lab experiments
Germplasms
Educational resources

- Aggregators
- Harvesting
- Repositories
- Validation
- Peer-reviewed journals
  Conferences, abstracting and indexing services, etc.
Documents

Aggregators

harvesting

Repositories

validation

peer-reviewed journals
Conferences, abstracting and indexing services, etc.
Take a Brief Tour of TEEAL
This tour will show you how to...

• ...search for articles, using both Quick search and Advanced search
• ...mark and save article citations
• ...browse the journal collection
• ...view and print full-text articles
• ...get help on using TEEAL
• ...contact the TEEAL office
Basic navigation

Click a tab to see that section

Click the links in the breadcrumb trail to navigate through the pages you have visited

Type in keywords or a phrase for quick searching

Click on the links at bottom to see any section
Quick Search

Type in a Keyword(s): subject terms; phrases; all or part of an author name; article or journal title; location or year.

Use **Boolean operators** and **parentheses** to search using multiple keywords.

Click the Find it button.

For more options, go to Advanced Search (see next slide).
**Advanced Search**

- **Add search terms here**
- **Limit by date**
- **Limit by journal(s)**
- **Choose search fields**
In Advanced Search you can also use…

- **Boolean operators:** put *and*, *or*, *not* between search terms
  - rice *and* pesticides
  - corn *or* maize
  - banana *not* plantain

- **Wildcard characters:** use * to substitute for 0+ characters, ? for single characters
  - appl* matches *apple, apples, application*
  - appl? matches *apply, apple, but not apples, application*
Organize, mark, and save your search results

- Search terms are shown here
- Select or deselect all results on a page
- Select a record by clicking the checkbox
- Sort search results by different fields
- Save and print selected results
- See multiple search result pages
- Click on the article title to see a full citation
- Go directly to full text
Browse our collection of nearly 250 journals

- Alphabetical list of all journals can be expanded
- Click the Journals A-Z tab
- Click a letter to expand
See all volumes and issues…

Click a year to expand it and see all available volumes and issues.
...and see all articles in each issue

Click on the links in the breadcrumb trail to navigate to previous pages
Click an article title to view the full citation
Optimal conditions for bioremediation of oily seawater

Abstract: To determine the influence of nutrients on the rate of biodegradation, a five-level, three-factor central composite design (CCD) was employed for bioremediation of seawater artificially contaminated with crude oil. Removal of total petroleum hydrocarbons (TPH) was the dependent variable. Samples were extracted and analyzed according to US-EPA protocols. A significant (R²=0.9641, P<0.0001) quadratic polynomial mathematical model was generated. Removal from samples not subjected to optimization and removal by natural attenuation were 55.3% and 32.6%, respectively. Numerical optimization was carried out based on desirability functions for maximum TPH removal. For an initial crude oil concentration of 1 g/L supplemented with 190.21 mg/L nitrogen and 12.71 mg/L phosphorus, the Design-Expert® software predicted 60.9% hydrocarbon removal; 58.6% removal was observed in a 28-day experiment.

Other Title: Optimal conditions for bioremediation of oily seawater

Language: English

Descriptors: bioremediation, bioremediation, computer software, contamination, hydrocarbons, mathematical models, methodology, nitrogen, nutrients, oil and gas industry, oil spills, oils, optimization, petroleum, petroleum hydrocarbons, pollutants, responses, sea water

Identifiers: computer programs, crude oil, environmental pollution, gasoline, methods, seawater

Subject Codes: ec300, zn100, zn950, pp600, mmzm000, pp200

Supplementary Info: 35 ref.

Copyright: Copyright CABI International

Click the links to save or print the citation
Click the link to view full text

Basic citation information
Full abstract
Additional citation and copyright information
...and the full text in PDF

Click the disk icon to save the article

Click the arrows to view article pages

Articles open inside a browser window or tab with Adobe® Reader®

Click the printer icon to print the article

Zoom in or out with the + / - buttons
View your Search History

You searched for: yucca

See the terms and operators from each search in a session

Click on a search to go to a search page with your terms filled in

Number of search results is also shown

Access Search History from the Search Results page
If you need help…

Detailed instructions are provided for every part of the program.

See Search Tips on the Quick Search and the Advanced Search page.

View the FAQ for answers to common questions.

Click the help tab to see the full help section.

Introduction

TEEAL is a compilation of the most important journal literature in the field of agriculture, and related sciences, available to researchers, faculty and students. It provides full-text articles, citations, and abstracts for over 200 journals. It is available only to non-profit organizations, such as universities and research centers in approximately 100 income-eligible countries. It offers a user-friendly interface with rapid search capabilities. It currently contains literature from 1993 up through the past publishing year. It releases annual updates at the end of each year.

Please read the rest of the Help Section for detailed instructions on how to use TEEAL.

To search the Help Section for a particular topic or word, use the Find function within your browser (usually by typing Ctrl-F).
Questions about TEEAL?

• Go to our website: www.teeal.org
• Email our office: teeal@cornell.edu
TEEAL
The Essential Electronic Agricultural Library
What is TEEAL?

TEEAL (The Essential Electronic Agricultural Library) is a digital collection of over 250 research journals for agriculture and related sciences.

Researchers, students, faculty and librarians can discover and access thousands of full-text PDF articles without the use of the internet. TEEAL is available to institutions in income-eligible countries.
Subject Coverage

- Agricultural Engineering
- Agriculture
- Animal Science/Veterinary Medicine
- Biology
- Biotechnology/Applied Microbiology
- Chemistry/Biochemistry/Biophysics
- Economics/Social Science/Development
- Entomology/Pest Control
- Environment/Ecology/Natural Resources
- Fisheries/Aquatic Science
- Food Science/Nutrition
- Forestry
- Human Medicine/Physiology
- Plant Science/Soil Science
PROTA: Plant Resources of Tropical Africa

This database of plants in tropical Africa contains 7,000+ varieties of plant, their uses, and much more information.

PROTA has been included in TEEAL since the 2009 Update and updates to the program are included in every TEEAL Update.
Some Example Publishers in TEEAL

- CSIRO
- Elsevier
- FAO
- NRC Canada
- Oxford Press
- PROTA
- Taylor and Francis

African Journal Publishers

- Academic Journals
- South African Veterinary Association
- Kenya Society of Microbiology
- Agricultural Society of Nigeria
- South African Association of Botanists
- Rural Outreach Program
- Bunda College of Agriculture Repository
New Journals

< This is a sample of the new journals in TEEAL’s 2010 Update. Want to see an entire list of journals that TEEAL has available? Visit: teeal.org/journals and click on the “New journals”-tab
WHY TEEAL?
Why TEEAL?

- It is an ASSET
- Subscribers become owners of 250 journals worth $1 million
- NEW journals added every year
- Spans 20 years of content
- Full-text article PDFs from over 80 publishers
- Updated annually with new content
TEEAL’s relevance in an on-line world

- Internet time is still very costly and limited at many ACP institutions

- Subscription costs are high and library budgets are meager

- TEEAL offers ownership, not just access

- It is equal to 200 journals on a virtual shelf in the library and more journals coming in 2011 Update
How TEEAL Works

- TEEAL
- Server hosting TEEAL
- Install TEEAL
- Retrieve Articles
TEEAL Then...
TEEAL Now...
“Wheat” as a query in TEEAL

TEEAL - The Essential Electronic Agricultural Library

Search and browse our offline database to locate and read full-text articles from over 250 journals in the agricultural sciences.

Quick Search

wheat

Not sure where to start? Browse our journals...

Find articles in disciplines such as:

- Agriculture
- Animal science
- Biotechnology and microbiology
- Chemistry and biochemistry
- Economics and social science
- Environment and natural resources
- Food science and nutrition
- Forestry
- Human medicine and physiology
- Plant and soil science
Results for “wheat” in TEEAL

Over 12,000 relevant results!

1. Organic matter turnover in a calcareous clay soil from Syria under a two-course cereal rotation
   in Syria. Six rotations were sampled: wheat-vetch [Vicia], wheat-lentil [Lens culinaris], wheat-wheat, wheat-chickpea [Cicer arietinum], wheat-fallow

2. Shoot growth, root growth and grain yield of bread and durum wheat in South Australia
   In South Australia, durum wheat (Triticum durum) yields more than bread wheat (Triticum aestivum) under sufficiently watered and cereal belt the yields of durum wheat, relative to bread wheat, are low. Three experiments were conducted
Organic matter turnover in a calcareous clay soil from Syria under a two-course cereal rotation

Abstract: Total organic and microbial biomass C were measured in soils from a two-course rotation experiment in Syria. Six rotations were sampled: wheat-vetch [Vicia], wheat-lentil [Lens culinaris], wheat-wheat, wheat-chickpea [Cicer arietinum], wheat-fallow and wheat-maize [Majumdo]. Ten years after the experiment started in 1983/84, soil samples (0.20 cm) from the wheat-vetch, wheat-lentil, wheat-wheat and wheat-chickpea rotations all contained similar quantities of organic C and microbial biomass C. The soil under the wheat-maize rotation had gained organic C and biomass C, compared with the wheat-wheat rotation, whereas both organic C and biomass C had fallen in the wheat-fallow rotation, although of all those differences, only the wheat-maize gain was significant (P<0.05). Radiocarbon was measured in two soil samples from the wheat-wheat rotation, and the mean radiocarbon age was 550 years. An updated version (ROTHC-26.5) of the Rothamsted Model for the turnover of organic matter in soil was used to simulate these measurements. The calculated annual inputs of plant C (in roots, stubble, root exudates) to the soil, averaged over the 2 years of each rotation, were: wheat-vetch, wheat-lentil, wheat-wheat, wheat-chickpea, wheat-fallow, wheat-maize (0.87, 0.71, 0.71, 0.75, 0.45, 1.20 t Ch ha per year, respectively). The modelled turnover time of soil organic C in the wheat-wheat rotation was 19.2 years.
TEEAL Distribution by Region

- **Africa**: 69%
- **Asia**: 19%
- **Europe**: 2%
- **Oceania**: 2%
- **Americas**: Central America (3%)
- **Americas**: Caribbean (3%)
- **Americas**: South America (2%)
Percentage of TEEAL Distribution by Country 
(341 Sets Sold)
A Map of Institutions w. TEEAL
HOW TO OBTAIN TEEAL
How to Obtain TEEAL

• Variety of discounts are available based on funding through CTA and/or Gates Foundation

• Email teeal@cornell.edu for more information
Your Asset to Keep
Access is never switched off
What TEEAL Users Think

“TEEAL is indeed very accessible and very useful database for the whole SEAFDEC/AQD community. Our scientists and researchers were very amazed about the it, for it provided them wide-array of quality peer-reviewed scientific papers for their research needs. (...) TEEAL is a very useful and user-friendly database of quality, peer-reviewed scientific agricultural researches, and I strongly recommend it.”

– Luisa G. Pacino, Former Head of SEAFDEC Aquaculture Department Library, Aquaculture Department Library, Southeast Asian Fisheries Development Center (SEAFDEC), Philippines, August 2011
Visit us on the Web

• TEEAL Website:  www.teeal.org
• ITOCA website:  www.itoca.org

• Facebook - search for TEEAL
QUESTIONS?
In this module, you will learn:

• What exactly a database is
• How a database differs from an internet search engine
• How to find information in a database
What is a database?

- A database is an electronic filing system for information.
- With a database, you can search and retrieve the information you need.
- You can also create your own databases and store the information you need there.
Databases vs. Web Search Engines: Similarities

- Web Search Engines like Google, Alta Vista, etc. search the worldwide web.
- When you search the web, these Web Search Engines rank the results of your query, usually by relevance.
- Databases often work in a similar way. You can search them for the information you need, but it helps to know **how to best conduct your search**.
Databases vs. Web Search Engines: Differences

- Unlike Web Search Engines, Databases are available through paid subscriptions and limited access.
- Some databases are available online (AGORAA), while others need to be installed locally (TEEAL).
- A database is often created around a single theme, like “art” or “agriculture.”
- They are often more specific and authoritative than simply searching the web for information.
TEEAL, an agricultural database

- TEEAL is an example of an academic database.
- It stands for “The Essential Electronic Agricultural Library.”
- TEEAL compiles high quality journal articles in various disciplines related to agriculture.
- The search tips we will learn in this module can be used in TEEAL.
“Wheat” as a query in google

Over 343 million Page Results

The title of the result is often the page title

If the host provides a description with Page Title, the description shows up

Other Google Tools such as Aggregated News and Images
“Wheat” as a query in TEEAL
Results for “wheat” in TEEAL

Approx. 10,000 records from peer reviewed journals
Some definitions

- A **record** is an individual piece of information in the database.
- An **index** is a collection of records.
- Commonly, an academic database will contain an index of records that contain the **citation** and **abstract**, and a link to a **full-text article**.
Here is an example of an academic database record in TEEAL

Article Title

Characterization of corn nitrogen status with a greenness index under different availability of sulfur

Abstract: Several methodologies measure leaf greenness intensity and relate it to crop N status. There is no evidence, however, of the utility of this variable to detect N deficiencies in corn (Zea mays L.) under S deficiency. The objective of this work was to evaluate the potential of two indexes based on leaf greenness intensity to detect N deficiencies in corn under different levels of S. Two experiments at Balcarce, Argentina (Bce I and Bce II), and one at 9 de Julio, Argentina (9d), were conducted during the 2005-2006 and 2006-2007 seasons with different levels of N and S. Weekly measurements of greenness index (GI) were performed, and whole-plant samples were taken at four developmental stages to determine crop N and S accumulation. No N x S interaction was found in any measured variable. Nitrogen increased dry matter N and S accumulation, grain yield, and GI. Sulfur fertilization resulted in increased S accumulation in all experiments, and grain yield at Bce II and 9d. This nutrient also increased GI during several crop stages in all experiments. A nitrogen sufficiency index (NSI) was related to its relative yield (R2: 0.67, 0.63, 0.43, 0.67 for stages V5-V8, V9-V11, V13-V14, and V15-V18, respectively) under different S levels. On the other hand, a new index called relative greenness index (RGI), proposed for situations that could present S deficiencies, was also related to its relative yield (R2: 0.67, 0.81, 0.63, 0.82 for stages V5-V8, V9-V11, V13-V14, and V15-V18, respectively) under different S levels. The regression lines of both indexes were concordant for all sample dates. It was concluded that crop N status can be characterized under different levels of S through the NSI. Future research, however, should test these results under a wider range of S levels.
How to search a database

- Many databases have instructions or search tips to make searching for what you need easier.
- While databases differ, there are some general commonalities when conducting a search.
- Find out if the database has different types of searching, like an “advanced” option.
Simple vs. Advanced Searching

- A simple or quick search may be only for one search term, and may search all the records. This is good for a start, but you could find too much!
- Maybe you want to save time and find only specific results.
- In an advanced search, some databases will allow you to specialize your searches.
Advanced Searching can use more specific search terms, like title, author, date, etc.
Boolean Operator Searching

• A common method for specifying your search is to use Boolean operators.

• Like the Advanced Search option that many databases have, Boolean operators (and, or, not) make searching for what you need easier.
Using AND to search will limit your results . . . .
AND.

- For example “farming” AND “tropical” would only find records containing both words.
- Records containing just “farming” or just “tropical” would not show in your list of search results.
- AND is useful when you need specific results!
Using OR to search will widen your results . . . .
OR......

- The OR search term is useful when you are using inter-changeable search terms, meanings that have two definitions, or different languages.

- For example, when searching for “internet” OR world-wide web” or “wheat” OR “trigo” (Spanish for wheat)
Using NOT will exclude part of your search....
Perhaps you want to find articles on the topic “global warming” but NOT written by Dr. Martinez.

Using NOT allows you to see all the articles about global warming excluding this author.

(It would be useful in this example to use the advanced search, with Martinez in the author field and global warming in the subject)
Two more search tips * and “”

- Another common search tip involves truncating words by using the * symbol, to help you get variations.
- For example: searching for appl* would return results for apple, apples, application, applies, etc. Or librar* would return library, libraries, librarian.
- The * symbol can be used in any position in a word.
Use of Parenthesis “” marks

- Using quotation marks makes the search engine look for exact phrases within a web page. E.g. “Animal Husbandry”
You already may have used a database!

- Databases are everywhere; many are online.
- **Even a simple cell phone is akin to a database.** It stores the telephone numbers of your friends and family, and you can search and retrieve those numbers to make your phone call.
- Online, the website **Youtube** is a massive database of uploaded videos.
Activity

- **Name** one database you have used before, one you have heard about, or one you have learned about today.
- **Explain** its features. What makes it a database, and not something else?
- **How do you search and retrieve information in this particular database?**
- **Finally, present** your answers to the group.
Takeaways

- Whether you have been exposed to databases before, or if they are new to you, an understanding of databases can dramatically impact your level of information literacy.

- Now you have the understanding to do some skilled searching for the information you need!
**TEEAL Exercise 2**

**Using TEEAL Basic and Advanced Search**

Q1 On the home page of TEEAL, the Quick Search box allows you to search for articles quickly using keywords or a combination of keywords using boolean operators. Type "rice" into the Quick Search box and click on the Find it button. How many articles did you find?

- Approximately 7900 results (1)
- No results (2)
- Over 1 million results (3)
- Approximately 500 results (4)

Q2 Return to the home page of TEEAL by clicking on the Home tab. Let's learn the important difference between the three important operators: AND, OR and NOT. 1. Type "rice AND virus" into the Quick Search box. Make a note of the total number of results. 2. Return to the Quick Search screen on the home page. 3. Type "rice AND NOT virus" in the Quick Search box. Make a note of the number of results. 4. Type "rice OR virus" in the Quick Search box. Make a note of the number of results. Which of the following statements is true about how boolean operators impact the number of results?

- The number of results using OR is less than the number of results using AND (1)
- The number of results using AND is less than the number of results using OR (2)
- The number of results using NOT is equal to the number of results using AND (3)
- The number of results using OR is less than the number of results using AND NOT (4)

Q3 TEEAL provides links to full text articles in the database. You can read the full articles quickly using TEEAL. However, it is important to note that the search function cannot search the actual text of the PDF articles. It is only searching the article title, journal title, author name, ISSN, volume, issue, descriptors, and abstract. Let's try one more exercise to understand the search function better. It is important to think about the keywords that you enter and how you enter them into the search. Return to the home page by clicking on the Home tab. For instance, let's say that we are interested in finding articles about the yellow mottle virus and rice. Type "effect of yellow mottle virus on rice" in the Quick Search box. How many results do you get?

- 100 (1)
- 5000 (2)
- 0 (3)
- 6 (4)

Q4 Type "yellow mottle virus AND rice" in the Quick Search box click Find it. Now how many results do you get?

- 30 (1)
- 0 (2)
- 2000 (3)
- 5 (4)
Q5. On any TEEAL page, click on the Advanced Search tab. Highlights of the Advanced Search are: It allows you to combine several keywords and specify which fields you would like to search (article title, journal title, author name, ISSN, volume, issue, descriptors, and abstract). You can also limit the search to specific journals by choosing them from the list. You can also limit to a date range in years, such as 2008 to 2009. The same principles of boolean operators apply to the Advanced Search. Let’s try and find articles on stem rust or leaf rust affecting wheat. Using the Advanced Search feature, what is the correct search string construction to find articles on stem rust or leaf rust affecting wheat?

- Wheat AND stem rust AND NOT leaf rust (1)
- Wheat OR stem rust OR leaf rust (2)
- Wheat OR stem rust and leaf rust (3)
- Wheat AND (stem rust OR leaf rust) (4)
Workshop options

• Presentation – what is VIVO, the technologies it uses, and how it's used at Cornell and elsewhere

• Self-paced tour on the computer at your seat, using vivo.vivoweb.org and other VIVOs around the world

• Open Q&A with developers of VIVO and AgriVIVO
Self-paced tour

- [https://wiki.duraspace.org/display/VIVO/Short+Tour%3A+VIVO+Overview](https://wiki.duraspace.org/display/VIVO/Short+Tour%3A+VIVO+Overview)

- Uses the VIVO community sandbox:
  - [http://vivo.vivoweb.org](http://vivo.vivoweb.org)
  - Log in as [editor@vivoweb.org](mailto:editor@vivoweb.org)
  - Search for IAALD

- Includes pointers to outside resources and a list of VIVO sites to explore
What is VIVO?

- A semantic-web-based research and researcher discovery tool
  - People plus the research they do
- Publicly-visible information, across disciplines
  - For external as well as internal audiences
- An open, shared platform for connecting scholars, research communities, campuses, and countries using Linked Open Data
<table>
<thead>
<tr>
<th>Year Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003-2005</td>
<td>First realization for the life sciences at Cornell, as a relational database</td>
</tr>
<tr>
<td>2006-2008</td>
<td>Expansion to all disciplines at Cornell, and conversion to Semantic Web</td>
</tr>
<tr>
<td>2009-2012</td>
<td>National Institutes of Health-sponsored <em>VIVO: Enabling the National Networking of Scientists</em> project transforms VIVO to a multi-institutional open source platform</td>
</tr>
<tr>
<td>2013-2014</td>
<td>VIVO Incubator Project with DuraSpace for open community development</td>
</tr>
</tbody>
</table>
Key VIVO principles

- Open software
- Open data
- Open ontology
- Open community
- Decentralized infrastructure
  - Local control
What does VIVO do?

• Integrates multiple sources of data
  – Systems of record
  – Faculty activity reporting
  – External sources (e.g., Scopus, PubMed, NIH RePORTER)

• Provides a review and editing interface
  – Single sign-on for self-editing or by proxy

• Provides integrated, filterable feeds to other websites
What does VIVO model?

- People and more
  - Organizations, grants, programs, projects, publications, events, facilities, and research resources
- Relationships among the above
  - Meaningful
  - Bidirectional
  - Navigable context
- Links to URIs elsewhere
  - Concepts, identifiers
  - People, places, organizations, events
Abawi, George Samuel  |  Professor

Positions

- Plant Pathology at Geneva, Professor

George S. Abawi is a professor of Plant Pathology and International Agriculture at Cornell University. He received his MSc. And Ph.D. degrees from Cornell. He was a Postdoctoral Fellow in Plant Nematology at Cornell from 1970 to 1972, after which he was appointed as a faculty member in the Department of Plant Pathology at the NYS Agric. Expt. Station, Cornell – Geneva. The major area of his research responsibility deals with Vegetable Pathology, with emphasis on the biology and the integr (... more)

Research Areas

plant pathology  collaborative research area (CALS)
People and what they do
Co-Author Network  [GraphML File]

Profile

Riha, Susan Jean
Charles L. Pack Professor in t...
VIVO profile | Co-author network

132 Publication(s)
33 Co-author(s)
1980 First Publication
2010 Last Publication

Note: This information is based solely on publications which have been loaded into the VIVO system. This may only be a small sample of the person's total work.

Structured data for visualizations
Typical data sources

- HR – people, appointments
- Research administration – grants & contracts
- Registrar – courses
- Faculty reporting system(s)
  - publications, service, research areas, awards
- Events calendar
- Internal and external news
- External repositories – *e.g.*, Pubmed, Scopus
Value for institutions

- **Common data substrate**
  - Public, granular and direct
  - Discovery via external and internal search engines
  - Available for reuse at many levels

- **Distributed curation**
  - E.g., affiliations beyond what HR system tracks
  - Data coordination across functional silos
  - Feeding changes back to systems of record
  - Direct linking across campuses

- **Data that is visible gets fixed**
Enter data once, use it many times

The Abrúña Group focuses on the development and characterization of new materials using a wide variety of techniques for fuel cells, batteries, and molecular assemblies for molecular electronics.

Overview

Our research effort takes an interdisciplinary approach to the study of electrochemical phenomena. We employ electrochemical techniques as probes of a variety of chemical systems, and we use other techniques such as x-ray based methods, differential electrochemical mass spectrometry, in-situ FT-IR, scanned probe microscopies, scanning electrochemical microscopy, low temperature conductance and spectroscopic techniques to address problems of electrochemical interest. Current areas of research include:

1. **Fuel Cells:**
   - The use of ordered intermetallics, such as BiPt for the electrocatalytic oxidation of formic acid, methanol, ethanol and other small organic molecules of potential utility as fuels in fuel cells.
   - Use of Differential Electrochemical Mass Spectrometry (DEMS), in-situ FT-IR in for mechanistic studies related to fuel cells.
   - Development of in-situ TEM techniques for the study of fuel cell and battery materials

2. **Electrical Energy Storage (EES): Batteries and Supercapacitors**
   - Computational screening synthesis and characterization of organic molecules for EES
   - In-situ testing of battery systems using in-situ x-ray based technique (XRD, EXAFS, XANES)
   - Lithium/sulfur batteries
Overview

local program

4-H Beef Breeding Project at CCE Chautauqua

4-H Clothing and Textiles at CCE Chautauqua
CALS Research and Impact
Information about CALS research projects and their impact throughout the world

Find CALS projects by date, geographic focus, or other criteria

995 projects

Mentor junior extension faculty in journal submission

2009 to 2012
Over the past two years, I have engaged a number of (7) EDI extension professionals in the writing of ten articles (Melissa Bjelland, Arun Karpur, Sarah von Schrader, Thomas Golden, Ray Cebula, Sukjong Pi, Carol Blessing), as well supported Melissa Bjelland and Doug Webber in working on two articles to complete responsibilities on two grants that I oversee.

Nutritional needs of the developing chick embryo

2007 to 2008
Eggs contain approximately 200 mg of cholesterol. This project will determine how much of this cholesterol is needed for chick embryo development and will determine the consequences of cholesterol deficiency for the developing embryo.

CCE educators lend garden-based learning knowledge to Cornell students

2008 to 2009
Cornell Cooperative Extension educators increasingly find it challenging to make meaningful connections in a “too busy” world. In addition, they rarely have opportunities to engage with Cornell undergraduate. This is unfortunate for the educators, who benefit from the innovative engagement with the students, and for the students, who benefit from the real world connections and mentoring opportunities offered by interacting with educators.
CALS Research and Impact

Information about CALS research projects and their impact throughout the world

International and domestic locations where CALS research focuses

International

280 projects focusing on 142 countries

- Choose a country -
Show projects
VIVO for atmospheric and space physics

Woods, Thomas N | Associate Director of Technical Divisions
Dr. Tom Woods is Associate Director of Technical Divisions at the Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado. He obtained his BS in Physics in 1981 from Southwestern at Memphis (now Rhodes College) and his PhD in Physics in 1985 from the Johns Hopkins University under the direction of Dr. Paul Feldman. Tom joined LASP in 1987 to work on the UARS SOLSTICE program under the direction of Dr. Cary Rottman. He originally served as the SORCE Project Scientist (more)

Research Areas
Astrophysics | Solar Physics

Affiliation
Principal Investigator Of
- Extreme Ultraviolet Variability Experiment (EVE)
- Solar Extreme Ultraviolet Experiment (SEE)
- Solar Radiation and Climate Experiment (SORCE)
- Solar Stellar Irradiance Comparison Experiment (SOLSTICE)

Publications in VIVO
3 in the last 10 years (4 total)

Overview
The Total Irradiance Monitor (TIM) measures the total amount of radiation coming from the Sun. The sensor uses what is known as an absolute radiometer and houses four cone-shaped cavities. One of the cavities has an oscillating shutter that allows direct sunlight to shine into one of the cones. The material in the cone absorbs nearly all the Sun’s energy and heats up. By measuring the voltage needed to bring this heated cone back to the same temperature as one of the other “reference” cones, which are kept at a constant temperature, the instrument can obtain an extremely accurate reading of the TSI in watts.

Is an Instrument on
SORCE (January 25, 2003 – Present)

Publications
supported publications
- A new, lower value of total solar irradiance: Evidence and climate significance
- Intercomparison of SCIAMACHY and SIS-UV irradiance over several solar rotational timescales
- Solar total irradiance in cycle 23
Flight Equipment

Space Craft

- Cassini Orbiter
- POlar (POLAR)
- Solar Dynamics Observatory (SDO)
- Solar Mesosphere Explorer (SME)
- Solar Radiation and Climate Experiment (SORCE)
- Student Nitric Oxide Explorer (SNOE)
Cited 14 times
Linked to 23 publications
Related datasets 2
Part of 2 projects 9 collections

Identifier
DOI: 123234

Authors
Hardy, Thomas
Jehan Sorour

Contributors
Dickens, Charles

Description

Cite this dataset:
Why Cite?
Thomas, Hardy,
URL: www.urlsample.com

Rights and Restrictions:
Rights and restrictions content.
1. **VIVO** 2003-

Ithaca, N.Y.: Cornell University Library, 2003-

- Online

2. **In vivo**

*In vivo* (Norwalk, Conn.)

- Journal: Norwalk: Windhover Information Inc.,
- Online: Multiple locations

3. **Dinheiro Vivo**

*Dinheiro Vivo* (Online)

- Journal: [S.l.]: [s.n.]
- Online

4. **In vivo neuromethods** c1998

General neurochemical techniques.
Weill Cornell research reporting

• How has the number of publications co-authored with other institutions changed year to year?
Papers created with federal funding but not deposited in PubMed Central

Federal law mandates publications resulting from NIH-funded research must be deposited in the open access archives PubMed Central within twelve months... Read more
Policy issues

- Dirty data
- Lack even of common definitions of organizations or who’s faculty
- Data ownership
- Many dimensions of privacy
- Short-term “go it alone” vs. common good
The Semantic Web

• Turn data into a web of simple links

• Use *ontology* to explain *how* things are linked

• Use *reasoning* to add new links automatically

• Be flexible and extensible
CTSAnconnect and the ISF

- VIVO and eagle-i project for research resources won NIH funding in 2012 for a project to unify their ontologies and extend both in the clinical domain.
- The unified ontology is known as the Integrated Semantic Framework, or ISF.
- VIVO 1.6 and eagle-i’s next release will use the ISF.
- This combined ontology is modular to allow selective data population based on local needs.
The ISF/VIVO ontology

- Describe people, organizations, and research resources in the *process* of doing research

- Stay discipline neutral

- Use existing scientific domain terminology to describe *content* of research
What is Linked Open Data (LOD)?

- **Data**
  - Structured information, not just documents with text
  - A common, simple format
- **Open**
  - Available, visible, mine-able
  - Anyone can post, consume, and reuse
- **Linked**
  - Directly by reference
  - Indirectly through common references and inference
Linked Open Data
Find research and expertise

Enter keywords...

A demonstration of multi-institutional search

A group of seven top research institutions dedicated to facilitating global research efforts recognize the challenges faced by researchers in uncovering parallel and related efforts, and have decided to join forces in standardizing the way institutional data gets published. Each institution uses the VIVO software to manage and publish up-to-date information about researchers and their activities.

This website provides a working example of how a multi-institutional search functions, allowing you to search across all seven partner institutions and across all disciplines to find people and information that could dramatically
Find research and expertise

**Eckenrode, John**
- Building Infrastructure and Capacity: ARRA Funding National Data Archive on Child Abuse and Neglect at Cornell University Age-27 Follow-up of Early ...
  - Cornell University

**Nakashi, John A**
- Fifth Judicial Circuit Child Abuse Prevention Project (Capp) District 3 Capp Program District XII North Florida Area Health Education Centers Program ...
  - University of Florida

**Nunno, Michael A**
- and Understanding Abusive Families, Child Abuse and Neglect An International Journal, Children and Society, Protecting Children, Children and Youth Services Review ...
  - Cornell University

**Thomas, Margaret Gilboy**
- Project Child and Spouse Abuse Prevention: United States Marine Corps Army Community Services Program Accountability DOD Exceptional Family Member Program ...
  - Cornell University
Searchlight is a small app that automatically shows you VIVO profiles related to the page you're reading.
What is CTSAsearch?

CTSAsearch is a prototype demonstrating federated search using Linked Open Data published by members of the CTSA Consortium and other interested parties. To try it out, use the form below or click on the "CTSA Search" entry in the menu on the left.

Search for Investigators at Multiple Institutions

Enter search term: 

Search

Current Status

- Total persons indexed: 48,544
- Total publications by those persons indexed as part of their profile: 450,131

<table>
<thead>
<tr>
<th>Currently Harvested Sites</th>
<th>Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornell University</td>
<td>VIVO</td>
</tr>
<tr>
<td>Northwestern University</td>
<td>SciVal Experts and VIVO</td>
</tr>
<tr>
<td>Oregon Health Science University</td>
<td>SciVal Experts</td>
</tr>
<tr>
<td>University of California, San Francisco</td>
<td>Profiles</td>
</tr>
<tr>
<td>University of Florida</td>
<td>VIVO</td>
</tr>
<tr>
<td>University of Iowa</td>
<td>Loki</td>
</tr>
</tbody>
</table>

Indexed Content

- Persons and their associated properties (name, research statement, etc.)
- Academic Articles for each person with associated properties. Where DOIs or PMIDs exist additional information is added from MEDLINE, including
Multi-institutional scenarios for VIVO

- Multiple campuses of one university
- University and federal lab connections
  - *E.g.*, Colorado ties with regional federal labs
- Consortia
  - 60 NIH Clinical & Translational Science Awards adopted VIVO as an ontology standard in 2011
- International
  - 13 Netherlands universities and the National Library
  - AgriVIVO
AgriVIVO is a search portal built to facilitate connections between all actors in the agricultural field, bridging across separately hosted directories and online communities. **This is a prototype**

You can search for people, organizations and events. Read more on how to have data included in AgriVIVO. Read our new F.A.Q. and our terms of use.

**Last import date: 12/07/2013 - Next import: beginning of August 2013**

**Search for people**

Enter keywords...

Examples: "climate change", "capacity building", "rural development", "information management"

**Search by location**

- Choose a country -

View map

---

**10**
**DATA PROVIDERS**

**526**
**PEOPLE**

**4,474**
**ORGANIZATIONS**

**150**
**EVENTS**
Benefits across institutions/consortia

- Sharing experience provides clarity and new ideas
- Incentives from sharing development, tools, customizations
- Potential data-level connectivity
  - Research is happening increasingly in teams that span institutions
  - Meeting the needs of short and long-term virtual organizations
International engagement

Strategic partnership of euroCRIS and VIVO
23 November 2011  euroCRIS

euroCRIS, a not-for-profit scientific association registered in the Netherlands, and the leaders of the project team of VIVO, an open source Semantic Web software application originally developed at Cornell University, have entered into a strategic partnership.

euroCRIS (www.eurocris.org) is furthering the implementation and linking of Current Research Information Systems (CRIS) based on the Common European Research Information Format (CERIF) - commonly indicated with the acronym CERIF-CRIS - and promotes best practice in CRISs, spanning the field from raw experimental and simulated data through research management systems to research publications.
VIVO joins CASRAI in advancing research interoperability

Posted by Asha Law on Mon, 2012-04-23 09:18

The Leaders of the VIVO Project team (VIVO) and the Consortia Advancing Standards in Research Administration Information (CASRAI) are today announcing a collaboration to advance a common global approach to research interoperability.

VIVO is an open source ontology and software system designed at Cornell University for researchers and used in many universities in the USA that has attracted interest more widely internationally. It is based on the Semantic Web / Linked Open Data
Partnerships – ORCID

• Open Researcher and Contributor ID
  – Attribution for works of any type

• ORCID and VIVO
  – ORCID is an attribute in a VIVO profile
  – Tools being tested for submission of researcher registrations from VIVO

http://orcid.org
VIVO/DuraSpace Partnership

- DuraSpace is a not-for-profit organization supporting the DSpace and Fedora repositories
- Proven track record of managing community developed open source projects
- Two-year initial startup period
- Serves as the open source community home for ISF/VIVO ontology, software, tools, and engagement in eScience, research networking, and other initiatives
The VIVO Community

VIVOmap

Map of VIVO projects around the world

Tell us about your project, send us updates or corrections, or edit for yourself

This map shows adopters, partners, and collaborators on the VIVO project, primary identified through participation on the VIVO development or implementation mail lists -- note that many do not yet have public VIVO sites. Please only add symbols for sites that will be capable of offering VIVO RDF via SPARQL endpoints and/or linked open data requests.

Blue for VIVO, Red for Profiles, Yellow for Loki, Green for SciVal Experts
August 14 - 16, 2013
St. Louis, Missouri • vivoweb.org/conference
For more information

vivoweb.org, vivoweb.org/blog

wiki.duraspace.org/display/VIVO/VIVO+Main+Page

linkedin.com/groups/VIVO-connect-share-discover

facebook.com/VIVOcollaboration

github.com/vivo-project

@VIVOcollab
Questions?