

## Accessing and Sharing Knowledge Resources for Soil Health Research in Africa

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### Summary

Agricultural researchers and practitioners throughout Africa are conducting soil health-related research and applying the results, though many are not accessing or sharing available knowledge resources effectively. During 2007, 73 respondents (primarily researchers and educators with an interest in soil fertility) in 23 African countries were surveyed to identify: 1) where and how they access soil health and other agricultural information; 2) their use of libraries and agricultural networks; and 3) potential improved pathways for African soil health researchers to locate and share knowledge resources. The survey results suggest that building 1) librarians' capacity for outreach and accessing knowledge resources, and 2) network staff capacity for proactive knowledge brokering could be useful avenues to increase access, sharing and use of soil health research in Africa. Further study of networks and network membership will help determine the potential benefits of increasing inter-network links to share information more effectively among soil health researchers and between scientists and both practitioners and policymakers. Increasing support for collaborative efforts including low or no-cost information resources such as The Essential Electronic Agricultural Library (TEEAL) and AGORA (Access to Global Online Research in Agriculture) and promoting information sources on frequently-visited websites and at conferences could also improve access to soil health knowledge resources in Africa.

### Introduction

Improving soil health is a vital component for increasing agricultural yields and restoring degraded farmland in Africa. According to Sanchez (2002), soil fertility depletion needs to be addressed before other technologies and policies can become effective in overcoming hunger on the continent. While much agricultural research material is available in print and electronic formats, it can be difficult to find or is guarded by

expensive subscriptions. African research results are often not online at all and can be nearly impossible to find. Libraries in Africa often have small collections that are not up-to-date. And, for many African researchers as well as consumers of research results, the Internet is not an easy answer. Adequate bandwidth, connectivity, computer hardware and software, technical support and funds to pay for all of these are generally in short supply.

For those who do have adequate Internet access, there are several good programs that provide access to expensive agricultural journals online at low or no cost. These include, among others, Africa Journals Online, library agreements through the Programme for the Enhancement of Research Information (PERI), and AGORA and related initiatives such as Online Access to Research in the Environment (OARE) and Health Inter-Network Access to Research Initiative (HINARI). For those with bandwidth problems, TEEAL, while not entirely free to institutions, provides 130 journals on an external hard drive that can run on an institution's local area network (LAN) system or stand alone. Nevertheless, many people are still uncertain about how to navigate through the oceans of disorganized information to match what is available with what they are looking for. (TEEAL, 2008)

### Methods

A user survey designed to learn how those involved in soil health research in Africa locate relevant information, what they perceived to be the constraints to acquiring it, and what kind of soil health-related networks and other groups they belong to was distributed between May and August of 2007. The survey was made available via two mechanisms: 1) online through an interactive Survey Monkey site on the Internet; and 2) through e-mail or e-mail attachments forwarded to specific researchers, agricultural organizations, institutions, soils-related networks and interested attendees at the Forum for Agricultural Research in Africa (FARA) meeting in South Africa (June 2007) and the 4th International Conference of the African Soil Science Society (ASSS) in Ghana (January 2007). The data were analyzed using SPSS statistics software that enabled us to generate data summary tables.

### Results

*Characterization of the Respondents* – Among the people who completed the soil health information user survey by electronic means (e-mail or Survey Monkey), there were a total of 73 respondents from 23 countries.

Approximately 78% identified themselves as researchers and/or teachers. The majority of respondents were affiliated with Universities (45%), National Agricultural Research Systems (NARS, 27%) or International Agriculture Research Centers (IRCs, 18%), with a small

number employed by government ministries, non-governmental organizations or other institutions. Because there were so few representatives from the latter categories, our study focused on reporting results for the IRC, NARS and university respondents. Of this group of respondents, 40% were from Eastern and Central Africa, 37% from West Africa and 23% from Southern Africa.

**Sources of Information** – While over half of the soil health survey respondents in every category cited the Internet as a frequent source of information, they also appear to be getting their information from colleagues, conferences and (except for NARS) newsletters. Nearly 40% of IRC respondents reported getting information from colleagues frequently and nearly a quarter of respondents across institutions reported conferences as a frequent source of useful research information (Figure 1).

Researchers and information managers in IRCs had better Internet and journal access than university faculty or NARS. Except for private groups and IRCs, many researchers in NARS (especially those in more remote areas) and universities noted problems with bandwidth, connectivity, and computer hardware and software, as well as the expenses associated with using the Internet.

**Network Membership** – As shown in Figure 2, 68% of the 63 respondents who identified themselves specifically as researchers, university faculty/lecturers or program staff belonged to at least one soil health-related network or professional society, with 19% belonging to three or more. Soil health-related networks noted by these respondents included 15 pan-African, regional and national networks/professional societies in Africa and 4 global networks and associations.

Ninety percent of these respondents belonged to one or more agricultural network, with 44% belonging to more than three agricultural networks or associations.

**Use of Specific Internet Information Sites and Applications** – Of a provided list of 18 possible Internet sources of soil health research information<sup>1</sup>, Google Scholar, AGORA and CABI were the only sites that can be considered key sources across institution type ( $\geq 35\%$  citing frequent use); over 60% of university respondents cited frequent use of AGORA. IRCs additionally cited frequent use of African Journals Online (46%) and the CG Virtual Library (38%), while NARS showed frequent use (40%) of both FAO and NARS websites. Both NARS and universities cited frequent use of CTA sources ( $> 35\%$ ).

Very few reported belonging to e-mail based listservs or online discussion groups. With regard to the use of more “advanced” interactive Internet sharing techniques, few people had ever actually used any Web 2.0 tools such as wikis, blogs, RSS feeds, or social bookmarking, though VoIP (Skype) was frequently used by  $> 20\%$  of survey respondents across institutions; IRCs reported

FIGURE 1 – Most frequent sources of agricultural information (% reporting Internet, colleagues, newsletters, and conferences as a frequent source of agricultural research information)

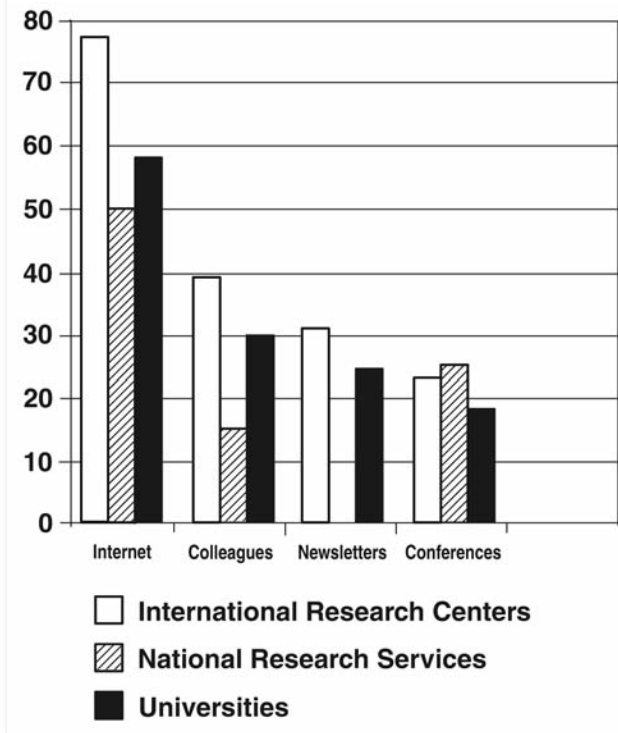
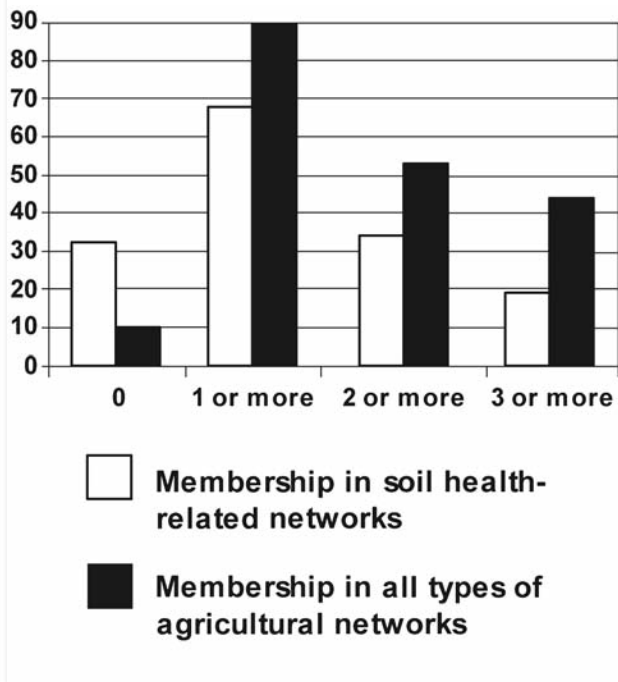


FIGURE 2 – Membership in Soil Health-related and Other Agricultural Networks and Associations (% of respondents who identified themselves as researchers, university faculty/lecturers, program staff – n = 63)



over 60% frequent use of VoIP. Many admitted that they had never even heard of the newer Web 2.0 applications.

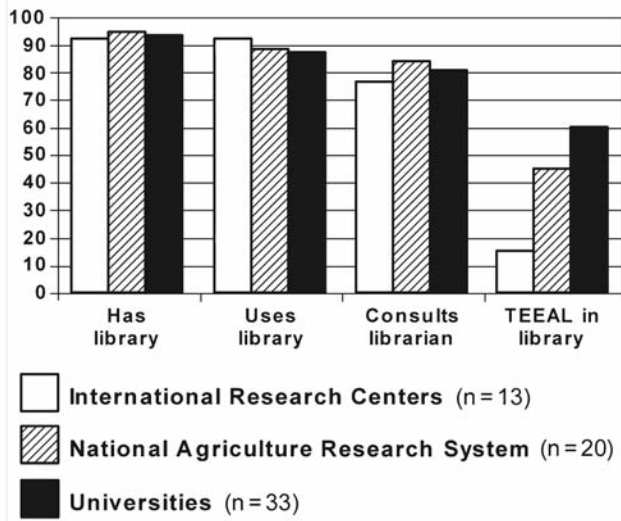
**Local Access to Knowledge Resources and Low-cost Information** – As shown in Figure 3, over 90% of all respondents had library access at their workplace and over 75% consulted their librarian at least occasionally; over 50% of all respondents consulted their librarian frequently. The reasons most often given for not consulting a librarian were that 1) the librarian was not well-trained, or 2) the library resources were so outdated that the respondent considered them of limited use. Universities had the best access (60%) to TEEAL, an agricultural research information resource that requires a computer but no Internet connection.

### Discussion and Next Steps

The survey on accessing and sharing knowledge resources in Africa by those involved either directly or peripherally with soil health research produced a number of interesting insights and suggestions for follow-up. These include the following:

- High rates of membership in soil health networks and other agricultural networks and associations suggest that further development of these entities as proactive knowledge brokers could increase information access and knowledge-sharing. This type of network development may also prove useful in linking those who have greater access to knowledge resources with those who do not. Network membership incentives, especially for students, could extend the benefits of linking with colleagues to a wider support community.
- Further study of networks and network membership needs to be undertaken to determine the potential benefits of increasing inter-network links to facilitate 1) collaborative problem-solving among soil health researchers, and 2) greater knowledge-sharing between scientists, practitioners and policymakers. Strengthening links between networks and libraries may also prove to be a valuable pathway for sharing information sources.
- As the survey indicates, respondents are finding research information from a number of sources. Knowledge-sharing strategies that use a blend of elec-

FIGURE 3 – Library Availability and Use (% by institution)



tronic, print and face-to-face components should continue to be stressed rather than focusing only on Internet access. [Despite Africa’s impressive Internet usage growth of over 1000% between 2000 and 2008, Africa continues to have the lowest percentage of Internet penetration (5.23%) of any continent (Miniwatts Marketing Group, 2008)]. As networks occasionally hold conferences/workshops, communicate with newsletters and/or e-mail, and put people in touch with colleagues, they are well-suited to serve people using the blended approach that matches respondents’ current information access patterns.

- Significant access to libraries and use of librarians shown in the survey results implies that 1) acquiring and using low or no-cost research resources (such as AGORA and TEEAL), and 2) training librarians in outreach as well as locating resources, could be efficient ways to increase awareness and use of soil health knowledge resources.
- The survey has identified a number of Internet-based resources that are frequently used; placing information about new knowledge resources on these and other subject-relevant websites will increase the likelihood they will be found by those who need them.
- AGORA is a frequently cited source of soil health information; development and promotion of a peer-based Current Alerts system drawing on articles readily available to researchers through AGORA could make it easier for African researchers to keep up to date.

**Limitations of the study:** Those who responded to the survey via e-mail and the online survey form had access to the Internet and/or e-mail and therefore do not necessarily constitute a representative sample of African

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researchers' access to electronic resources. Also, the network membership data may be skewed as some respondents received the survey through either the African Network for Soil Biology and Fertility (AfNet) or the Information Training and Outreach Centre for Africa (ITOCA) network.

## Note

1. African Crop News, Africa Journals Online, AGORA, AGRICOLA, AGRIS, Agritrop, ASARECA/CORAF/(SADC), Bioline International, CABI, CGIAR Virtual Library, CTA Resources, FAO sites, FARA, GFAR, Google Scholar, Highwire, Scirus/Ingenta/ISI, Local NARS websites

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