



# Society For Economic Botany Newsletter

# PLANTS & PEOPLE

A biannual newsletter published by and for the members of the Society For Economic Botany

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## In This Issue:

2017 Annual SEB Meeting .....	1
Global Meetings.....	1
Notes from the Field .....	2
Journal Editor's Corner .....	2
More 2017 SEB Meeting .....	3
DEB 2016 Interview.....	4
Student Committee News.....	5
Grants and Opportunities .....	5
2017 SEB Meeting: Tuesday Workshops.....	6
Biomimicry.....	6
Botanizing the Web .....	8
2017 SEB Meeting: Post-Meeting Field Trip.....	11
Politics .....	12
Publications and Presentations .....	14
Sustainability in the News.....	15
Cross-Pollination .....	19
New Academic Program.....	20



## Get Ready! Here comes the 2017 SEB Meeting in Bragança, Portugal!

### *Living in a Global World: Ethnobotany, Local Knowledge and Sustainability*

The 2017 meeting is coming up soon. Many of you have already registered. Thank you to those who have, and we hope others will finalize their plans soon. Everything you need to know is on the website. The lodging is available from hotels or local housing. To help you find convenient lodging, I have included a link to a google map so you can know what properties are in walking distance from the venue at the Campus de Santa Apolónia, 5300-253 Bragança, Portugal.

<https://www.google.com/maps/place/Instituto+Polit%C3%A9cnico+de+Bragan%C3%A7a++Escala+Superior+de+Educa%C3%A7%C3%A3o/@41.7939912,-6.7718312,17z/data=!3m1!4b1!4m5!3m4!1s0xd3a4a18b8ffff:0x89b5f181dd60f22f!8m2!3d41.7939912!4d-6.7696425>

Hope this helps. Also we have added a new post-meeting field trip. See page 11.

**Continued on page 3**



## Global Meetings

### Announcing

### 5th International Phytocosmetics and Phytotherapy Congress (IPPC2017): Linking Health and Beauty

Monday May 15, 2017 (9:00 AM GST)—Wednesday May 17, 2017 (5:00 PM GST)  
University of Patras, Greece

A special session called “Fragrance of History,” will welcome presentations on the history of medicinal plants and medicine in any geographic location. By Alan Touwaide

#### Congress Topics

- A) Nanotechnology: Novel Delivery Systems
- B) Sustainable Practice: Regulation, Standards, and International Markets
- C) Phytochemistry: Discovery and Extraction, Evaluation
- D) Bioactives: Novel Ingredients in Phytotherapy and Phytocosmetics
- E) Phytotherapy: Disease Prevention and Therapy
- E) Pharmacology: Toxicology of Natural Products
- F) Phytocosmetics: History, Quality and Market

Contact Secretariat: [IPPC2017@ijisonline.org](mailto:IPPC2017@ijisonline.org)  
<http://www.phytoessence.org/IPPC2017>

**Continued on page 10**

*Plants & People*

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The Society  
For  
Economic Botany**

**Website:  
<http://www.econbot.org>**

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The articles within the Newsletter are independently submitted and do not represent the position of The Society For Economic Botany as a whole.

Deadlines for submissions are February 1 (Spring Issue) and September 1 (Fall Issue).

## Notes from the Field

We are so excited about meeting in Portugal. There are many articles in this issue about the meeting so you can register right away, get lodging, and plan your travel. Check the meeting update page 1, Tuesday Workshops (page 6), and Student activities (page 5).

Recently there were many articles in the news about politics and science and so I thought to add these. (page 12). It is a time to be vigilant and stand up for scientific accuracy. If you can to join the March for scientists in D.C. on April 22, let us know and send us photos and reports.

Enjoy the Newsletter and send me your Botany News.

*Trish Flaster*

Trish  
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## Journal Editor's Corner

### New SEB Contract with NYBG

This year, our flagship journal, *Economic Botany*, entered into its 71<sup>st</sup> year of publication. Since the journal's inaugural issue in 1947, with Edmond H. Fulling as its first editor-in-chief, the journal has published over 2,300 research articles, notes, and reviews. In the very early years, the journal was produced by the New York Botanical Garden, which founded the journal, continues to hold copyright, and manages the journal's production and distribution through its contract with Springer. However, with the founding of the Society for Economic Botany in 1959, responsibility for producing the journal was transferred to our society, where it has remained ever since.

Every three years, the Society and the NYBG enter into negotiations to produce a new publishing agreement for the journal. Among the various features of the agreement, most of which deal with increasing the quality and stature of the journal, the issue of division of revenue from sale of the journal has been something of a sticking point in recent years. I am pleased to report, however, that an agreement was reached and signed off by Society President Steven Casper this past December 31<sup>st</sup>. Under this new agreement, revenue from Springer and all other sources will be divided 70 percent for the Society and 30 percent for NYBG. This represents a considerable improvement for the SEB over previous publishing agreements. This increased stream of revenue will allow the Society to further pursue its mission and goals, in particular its commitment to encouraging and rewarding students pursuing research in the area of economic botany and ethnobotany. I want to personally thank all of the principal parties who engaged in these negotiations, especially Brian Boom and Michael Balick at the NYBG, and Steven Casper, Gayle Fritz, Cassandra Quave, Dan Moerman, and Wendy Applequist of the Society. This is an agreement that benefits both parties, and that underscores the Society's continuing partnership with NYBG.

Bob Voeks, Editor-in-Chief

## More on SEB's 2107 Annual Meeting

### Living in a Global World: Ethnobotany, Local Knowledge and Sustainability

#### 58th SEB Annual Meeting and 2nd Hispano-Portuguese Meeting on Ethnobiology

Join colleagues from at least 25 Countries & 4 Continents

Our meeting will combine two events bringing together the European community and a broader international community of scientists and stakeholders, to create a unique opportunity for individuals and institutions to share experiences, and to establish information and collaborative networks.

#### SYMPOSIA:

Monday, June 5th

*Symposium 1:* Ethnobotany of Mountain Regions

*Symposium 2:* Economic Botany: Approaches from Archaeobotany, Ethnography and History

Tuesday, June 6th

#### 2nd Hispano-Portuguese Meeting on Ethnobiology (II EHPE)

- Cork and Cork Production
- Markets and Urban Ethnobotany
- Ethnobotanical Linguistics and Toponymy—The Study of Place Names
- Ecosystem Services
- Empowerment of Traditional Knowledge Holders and Politics
- Traditional Knowledge Networks
- Free Topics
- Teaching Tuesday” workshops

Wednesday, June 7th

Field trips/outdoors sessions

Thursday, June 8th

*Symposium 3:* Ethnobotany, ethnopharmacology and natural products: challenges and trends

*Symposium 4:* Agrobiodiversity and traditional knowledge: conservation and local development

- DEB presentation
- Thursday Gala DEB Dinner at the Museum Abade Baça



#### HIGHLIGHTS OF ACTIVITIES:

- Distinguished Economic Botanist Professor Roy Ellen lecture will be before our annual Banquet June 8. You don't want to miss this See page 4.

#### SPECIAL ATTRACTIONS:

- A beautiful and quiet campus, nearby the old city center and the green corridor, along the stream up to the Medieval Castle



- Keynote speakers' lectures:
  - ✓ Cassandra Quave, Emory University, USA
  - ✓ Ina Vandebroek, New York Botanical Garden, USA
  - ✓ Łukasz Łuczaj, University of Rzeszow, Poland
  - ✓ Rainer Bussmann, Missouri Botanical Garden, USA
  - ✓ Ulysses Albuquerque, UFPE, Pernambuco, Brazil
  - ✓ Victoria Reyes-García, ICTA-UAB, Barcelona, Spain
- Sunday June 4th Biocultural Collections Meeting
- Interdisciplinary technical and research presentations
- Poster session
- Workshops (see page 6)
- Exhibitions
- Morton and Fulling Student Awards
- Students' event
- Field trips to regional Natural Parks of Montesinho and Douro International: true outdoors sessions involving attendees, local communities' inhabitants, rural development associations, project supervisors
- Post Conference Field Trip to Cork processing area (see page 11).
- Monday Opening night: Port wine tasting
- Tuesday local produce tasting: Traditional and new trends in regional foods

- In a single registration fee you receive admission to all symposia and field trips, except the post conference field trip, to provide unique sociocultural and agroecological interaction
- Post-conference Travels: Cork Field Trip (see page 11) and opportunities to travel Portuguese and Spanish cities such as Miranda do Douro (PT), Porto (PT), Portwine Companies in Régua (PT) Salamanca (ES) or Santiago de Compostela (ES)

Venue is listed on the conference site on econbot.org. Local accommodations are offered to assist you with the exact meeting location so you can determine how far local sites may be. Here is the

**Continued on page 10**



## Interview with Professor Roy Ellen, Distinguished Economic Botanist 2017

Submitted by Alexander R. O'Neill [environeill@gmail.com](mailto:environeill@gmail.com) (February 27, 2017)

Over the past few weeks, I've interviewed Professor Roy Ellen, our Distinguished Economic Botanist for 2017, on the subject of economic botany in the twenty-first century. Throughout his prolific career, Prof. Ellen has sought to better understand modes of folk classification, cultural transmission, and the effects of environmental transformation on indigenous knowledge systems. Our conversation touched on some of his favorite ethnobotanical experiences, and includes a reflection on the future of Economic Botany.

We are going to start with the Sago Palm (*Metroxylon sagu*; Araceae), a prominent feature of the stygian swamp forests of eastern Indonesia. Anthropologist and Economic Botanist, Roy Ellen, has researched this palm extensively over a 40-year period, especially as used by the Nuau, an Indigenous group on the island of Seram. He has written about this experience throughout his career. He recalls:

"In 1973, I accompanied several Sago collecting expeditions to the large swamp forests at Somau, near the confluence of the Nua and Ruatan Rivers. We stayed there several nights and had to make rafts on which were built bivouacs to sleep under and on which we constructed fires to cook over. Everything was made from parts of the Sago palm, except the fuel, which we had to bring with us. The protein we consumed was either the grubs of Sago weevils or fruit bats feasting on Sago fruits. During the night it was silent, except for the activity of the bats and the occasional sound of a rotten five-meter palm crashing to the ground. The overall appearance of this kind of landscape is, as the botanist Edred Corner suggests, 'fantastic and awesome,' or as the Anthropologist Malinowski reflects for New Guinea, 'antedeluvian-looking'."



**Interviewer:** Did you ever expect that a single species—the Sago Palm—would have such an impact both on your career and your personal worldview?

**Roy Ellen:** I think that everything began to fall into place during that second trip to Indonesia in 1973. I began to see Sago as a cultural keystone species for the Nuau, not only as their most important food staple, but also as crucial for much of their material culture and metaphorical repertoire. It is the source of their identity. The status of the sago palm in the lives of Nuau and others of Seram was very clear from the outset of this fieldwork, dominating as it does the riparian landscape as well as—through its products—the built environment.

**Interviewer:** But it seems that your passion for economic botany, or ethnobotany, predated even your Ph.D. experience. Did you always anticipate doing this kind of research?

**Roy Ellen:** No. Actually, my mainstream interest in the field came quite late in my career, and emerged from a more general interest in ethnobiological classification. I was originally trained as an anthropologist at the London School of Economics, where I had learned a lot more about economic anthropology. Again, my interest in people-plant interactions really came about during my Ph.D. research on the Nuau system of swidden agriculture in the Moluccan Islands of eastern Indonesia, and in the late 1970s with my work on the regional Moluccan production system integrating the pre-colonial global trade in nutmeg and clove with subsistence reliance on Sago starch.

**Interviewer:** What was the most valuable lesson you learned during those early years, and how did it influence your career?

**Roy Ellen:** Well, my early work was a fast-track initiation into a whole lot of research methods that have now become standard amongst ethnobotanists. But really it was during this time that I began to appreciate the idea of fieldwork on plant knowledge as “participatory co-production.”

**Interviewer:** Can you elaborate upon what you mean by that?

**Roy Ellen:** This is a term that is increasingly used and which I think is useful. Participatory co-production highlights the obvious fact that we have no meaningful ethnobotanical research data or understanding without the active assistance of the people whose knowledge it is and who are responsible for creating various ethno-floras. Of course, it has taken on more political and legal connotations in recent years. We need to ensure that there is not only adequate recognition of the inputs of local people into the research process, but also that due emphasis is placed both on any benefits to local communities and on strenuously avoiding possible harms.

**Interviewer:** Many of our SEB Student Council members are doing fieldwork right now in places ranging from the Eastern Himalayas to the Western Sahara. What advice would you give to young scholars on ensuring that our research is ethically co-produced—research that is useful and accessible to knowledge holders and their communities?

**Roy Ellen:** I think that the ethos of organizations such as the International Society of Ethnobiology, various UN agencies and NGOs have created a moral environment in which it is difficult to not take these things seriously. I would like to think that such considerations have become routine in study design, but am aware that they continue to be eroded and short-circuited. Practically, feedback in accessible forms to local communities is becoming easier due to e-literacy and the Internet, and of course the communities themselves often insist on forms of feedback. There is no virtue in feedback in itself—except as a part of gesture politics—so full discussion with communities about the form in which they would like it is paramount. This is bound to vary from place to place

**Interviewer:** On that note, do you believe that careers with the United Nations or various (I) NGOs are the most impactful places for economic botanists? That is outside of the academy.

**Roy Ellen:** Well, I can answer this in the context of my students at the University of Kent in the

**Continued on page 5**

## 2017 DEB Interview

*continued from page 6*

United Kingdom. The MSc program in Ethnobotany that I initiated in the late 1990s arose partly from inquiries the Royal Botanic Gardens at Kew was receiving about training courses. There were none in the U.K. at the time. Although a good proportion of our graduates have over the years used the program as a springboard to a Ph.D. and academic career, most have moved into non-academic positions, for example working for international environmental NGOs, and plant education positions in botanic gardens

**Interviewer:** Is there any other advice that you would like to impart to our student members as they continue their studies?

**Roy Ellen:** A passion for plants is an essential precondition for our discipline, but it must be accompanied by a sincere respect for the people whose knowledge you seek to record and understand. Pragmatically, be patient during fieldwork. Learn the language. Always return your analyzed data to your informants.

**Interviewer:** You mentioned you're working on a new project. Can you tell us a little about this?

**Roy Ellen:** I am always impressed by early career ethnobotanists who manage to produce rigorous and authoritative overviews of the plant knowledge systems of particular peoples. For me this has been a life-long program of work that I am only now beginning to complete for the Nuauulu. My main objective here is to provide an insight into how the Nuauulu conceptualize and engage with plants as material phenomena and, to progress a bit further, the difficult task of the comparative study of how different people cognize their plant worlds.



## Student Committee News

Submitted by sandrabogdanova@yahoo.com

The student committee is hard at work organizing exciting and meaningful interactions for the 2017 meeting in Bragança, Portugal. The annual meeting will feature a mentor lunch that includes personalized matches of students and mentors. We will also host a student social to encourage the growth of SEB student group network. Lastly, we will finalize voting on the Mentor Award of Charles B. Heiser. Look for an email request to sign up as a mentor, details regarding the date and details for mentorship interactions, as well as the details of the student social on June 6. We look forward to seeing you. *Bem-vido a Bragança Portugal!*  
Thank you, Sandra Bogdanova, Student Rep.

### Student Awards

#### Call for Nominations for the Charles B. Heiser, Jr. Mentor Award

We would like to call for nominations for the Charles B. Heiser, Jr. Mentor Award. The Student Committee initiated the Award in 2007 to recognize outstanding economic botanists who have substantially impacted the training and professional development of economic botany and ethnobotany students. The Mentor Award is named in honor of Charles B. Heiser, Jr., Distinguished Professor Emeritus of Indiana University, and spotlights dedicated educators who foster the development of the field by example and through student mentoring. A student-nominated award, it acknowledges mentors who are experienced, knowledgeable, trustworthy friends, counselors, and teachers. Current SEB student members and recent graduates (up to 3 years) are invited to nominate a mentor who has influenced their development in the field of ethnobotany.

Students who wish to nominate a mentor should submit a letter to Sandra (sandrabogdanova@yahoo.com) and Alexander (environeill@gmail.com) explaining why their nominee should be selected for the award. Selection criteria can be found on the student section of the SEB website. We encourage students to nominate for the current year!

#### Call for Applications for the Richard E. Schultes Award

The application cycle for the Richard E. Schultes Award is once again open! The award was created in 2001 to honor the late Dr. Richard E. Schultes. Awarded to graduate student members of SEB, or members who have received their degree within the past year, the Schultes Award is intended to help defray costs of fieldwork. The award provides up to \$2,500 for research in economic botany. Details about application requirements and submission are available online, on the student section of the SEB website. The deadline is March 15, 2017.

## Grants, Summer Programs, Opportunities, & Participation

### Equator Prize

Submitted by Annie Virnig  
anne.virnig@undp.org

We just launched the call for nominations for the Equator Prize 2017. We are trying to find ways to bring together ethnobotany and the work at UNDP, and this is one really great way to recognize work going on in communities and with Ethnobotanists!

I think there may be some great nominations we could get from our members. We also have a fully drafted newsletter that just went out if that's helpful...



Cheers, Annie

### Research Experiences for Undergraduates (NSF-REU)

Become a National Science Foundation REU. Join undergraduates from around the country for a unique 10-week learning and living research experience in the southern Appalachians. Students conduct independent research in field ecology, evolution, behavior, and physiology under the supervision of resident scientists. REUs are internships that include all station costs, travel, and a \$5,250 stipend.

**Program dates: May 22 - July 28**

**Application deadline: February 20**

**Announcing 2017 Summer Programs**

**Field-based courses** are UVA Summer Session classes offered by nationally recruited faculty, and offered at the undergraduate and graduate level. Our NSF REU **undergraduate research** intern-

**Continued on page 7**

## Teaching Tuesday Workshops

Time	Workshops			
13:30- 15:00	1. Animal traction in sustainable agroforestry management.	2. Genesis of a natural skin care product – A journey with the Caribbean mango	3. Plants as Secret Agents of Change in the Caribbean	4. CONCIB-e: The Wikipedia of Spanish Traditional Ecological Knowledge
15:00-15:30	Break			
15:30-18:00	1. cont. Animal traction in sustainable agroforestry management.	5. Traditional wheat and home-made couscous in Trás-os-Montes	6. Book Series Advances in Economic Botany	7. Portuguese Ethnobotany – Material Culture
18:00-19:30	Dinner			

### 1. Animal traction in sustainable agroforestry management (3 hrs; limit 12)

João Rodrigues, APTRAN – Associação Portuguesa de Tracção Animal / Portuguese

**Intended Audience:** Undergraduate: lower division, Undergraduate: upper division, Informal Education + Rural development and research agents with an interest in the application of sustainable techniques in land management / young farmers / agroforestry agents.

**Short Description:** Participants will engage with modern use of draft animals, learn about its potential in agroforestry sectors, providing the trainees with adequate knowledge and tools to enable them to recognize animal traction as a modern, competitive and sustainable solution.

**Learning Objectives:** To illustrate how traditional knowledge can be the basis for modern technology used in animal traction; to summarize particular terminology and processes; to apply modern techniques in sustainable agroforestry management; to demonstrate *in situ* and with hands-on how to work in a respectful way with draft animals; to discuss the importance of local culture to conservation strategies of the agrobiodiversity.

**Presentation Description:** In a region where the use of animal traction has been a constant reality until very recently, and where there are still small producers who continue to use this technology, it is important to promote sustainable development models with the promotion of cultural practices compatible with the preservation of agrobiodiversity and soil conservation, introducing the concept of modern animal traction into a logical strategy for rural development. This workshop will start with a short presentation contextualizing the historical importance of the use of draft animals in the region, as well as the potential use of modern animal traction as a renewable, less impactful and economically viable source of energy, capable of reducing carbon emissions, encouraging self-sufficiency and reducing consumption of non-renewable resources.

Participants will have the chance to directly contact with working animals, always respecting its dignity, learn more about modern tools and harness systems, as well as different techniques to work with animals in different areas.

The aim is to provide the trainees with adequate knowledge and tools to enable them to recognize in animal traction a modern, competitive and sustainable solution, as a complement or alternatively to conventional models normally used, guaranteeing introductive quality training in an area previously neglected by rural development agents (policy-makers, universities, NGOs). APTRAN [www.aptran.pt](http://www.aptran.pt) FECTU [www.fectu.org](http://www.fectu.org)

### 2. Genesis of a natural skin care product – A journey with the Caribbean mango (1-½ hrs; limit 15)

Gia Gaspard-Taylor, Network of Rural Women Producers Trinidad and Tobago (NRWPTT)

**Intended Audience:** Undergraduate: lower division, Undergraduate: upper division, Informal Education

**Short Description:** Participants will be introduced to a brief history of mango in the Caribbean. The properties of mango and its diversity beyond its use as a food will be discussed. Participants will be engaged in the production of a skin care product based on mango extract.

**Presentation Description:** Purpose: To introduce participants to the importance of mango in Caribbean history and its value as a commodity.

**Learning Objectives:** Classification of mango and varieties, The ethnobiological value of mango in the Caribbean, Traditional methods of product development from mango, Teaching skills: Material for workshop duplication, Methods for extraction of mango actives, Skin care product development

Continued on page 7



## Teaching Tuesday Workshops

*continued from page 6*

### 3. Plants as Secret Agents of Change in the Caribbean (1-½ hrs; limit 20)

Rita Pemberton, University of the West Indies, St. Augustine Campus, Tacarigua, TRINIDAD AND TOBAGO

**Short Description:** Identify plants that have had a significant impact on a named territory or region. Explain the nature of their impact and illustrate the ways in which these plants have functioned as unrecognized agents of change.

#### Learning Objectives:

The workshop aims to:

1. Introduce and promote participant understanding of the concept of plants as secret agents of change.
2. Facilitate participant comprehension through cooperative learning in group activity to explain the concept.
3. Enable participants to
  - a. Apply the principle to their own regions/ countries or districts.
  - b. Compare and contrast their different experiences.
  - c. Classify the secret agency of plants into (a) different time periods and (b) different themes (historical and contemporary, health and medicinal, foods and foodways,, aesthetics and sport, cultural and traditional, positive and negative.)
  - d. Draw conclusions about the role of plant as secret agents of change

**Presentation Description:** Change and development have traditionally been conceptualized as the result of human agency and in the process other forces of change have been overlooked. This workshop seeks to examine one such, the important role plants have played as agents of change in the colonized world without being recognized. Participants will be exposed to higher cognitive activity by viewing plants from a different perspective, affording them an active rather than the traditional passive role in generating change. Participants will consider both positive and negative impact of plants in stimulating change. Participant will examine the topic in collaborative group sessions and would be required to make group dramatic or artistic presentations.

Some points of discussion

- ❖ Pride of Barbados, papaw and abortions
- ❖ Seed on the leaf Children's bush to treat colds in Ashanti it is called she carries her children on her back
- ❖ To make the baby slide out ochro and sesame seed
- ❖ Controlling reproduction

- ❖ Congo cane Saramaca funeral rites Ashanti similar
- ❖ Tamarind and baobab in Africa sacred now jumbie trees
- ❖ Food clothing, slave craft resistance
- ❖ Music perfumery, dance
- ❖ Correli the obeah plant in Jamaica, Spiritual in Africa bath

### 4. CONCIB-e: The Wikipedia of Spanish Traditional Ecological Knowledge (1-½ hrs; limit 20)

Victoria Reyes-García, Institut de Ciència i Tecnologia Ambientals (Universitat Autònoma de Barcelona), Petra Benyei, Institut de Ciència i Tecnologia Ambientals (Universitat Autònoma de Barcelona), Manuel Pardo-de-Santayana, Universidad Autónoma de Madrid, Manuel.Pardo@uam.es

**Intended Audience:** Informal Education, Any citizen, Researchers working in Spanish ethnobotany

**Short Description:** CONCIB-e is a citizen science wiki-like platform to gather and share Traditional Ecological Knowledge that might contribute to the Spanish Inventory of Biodiversity-related Traditional Knowledge. Participants will be introduced to the platform, will be able to test it and discuss its functionalities and use.

**Learning Objectives:** The learning objectives of this workshop belong to the cognitive domain. Specifically, the workshop learning objectives for participants are to:

1. Recall components of their own TEK system;
2. Adapt this knowledge to the written format,
3. Introduce it in the CONCIB-e platform;
4. Find related information and to compare it with own knowledge.

**Presentation Description:** Despite its importance for biodiversity conservation and environmental management, traditional ecological knowledge (TEK), understood as the adaptive knowledge system referring to the relations between humans and the environment existing in socioecological systems and cumulated after generations, is rapidly eroding. CONCIB-e (CONocimiento Ciudadano sobre la Biodiversidad, concibe.eu\*) is a web-based citizen science platform which aims to enhance the *in situ* and *ex situ* conservation of TEK through engaging citizens in TEK conservation. In CONCIB-e any citizen can both contribute biodiversity-related traditional knowledge (i.e., medicinal uses, agricultural management practices) and obtain similar information provided by other citizens.

The aim of this workshop is to familiarize participants with the use of the platform. The workshop

will start with a short presentation discussing the importance of putting traditional knowledge on the public domain and the tools that allow to do so. We will also emphasize the potential of ICT tools in ethnobotany. The workshop will continue with a hands-on session in which participants will learn how to i) register, ii) enter information, iii) consult information introduced by other users, and iv) use the platform fora. At the end of the workshop, participants will provide feedback on the platform utilities and functionalities. Given the current development of the platform, the workshop will focus on traditional agricultural knowledge. Participants will require to have access to a computer with internet connection and knowledge of Spanish (the language of the platform).

**Continued on page 9**



## Opportunities ....

*continued from page 5*

ship program is now in its 25th year.

### Field Courses

#### Session I (May 22 - June 9)

- Plant Diversity & Conservation
- Field Herpetology
- Science Writing (May 22 - June 2)

#### Session II (June 12 - July 7)

- Field Biology of Fishes
- Session III (July 10 - 28)
- Field Biology of Insects

#### Financial aid is available.

MLBS courses are field-intensive, research-based experiences. Courses earn 3 UVA Biology credits. Non-college students are welcome to enroll.

For more information contact:  
mlbs@virginia.edu  
Mountain Lake Biological Station  
University of Virginia  
PO Box 400327  
Charlottesville, VA 22904

**Continued on page 11**

## Biomimicry

### BioNurse of Chile wins the Ray Anderson Ray of Hope 100K prize.

The Ray C. Anderson Foundation's Biomimicry Global Design Challenge is an international competition and accelerator program that crowdsources nature-inspired solutions to big sustainability challenges, such as climate change, food system issues, water management, and alternative energy. Approximately 25 percent of the world's soil is degraded, and the winning concept provides a new way to protect seedlings and restore soils back to health. The prize was announced at the National Bioneers Conference, where BioNurse presented their project to protect seedlings to return the depleted and abandoned soils of Chilean orchards. The BioNurse team has created the BioPatch, a biomimicry solution that enhances soil's capacity to retain water, nutrients, and microorganisms so that degraded land is restored for the next generation of crops. The container is fabricated from corn stalks, utilizing a resource that otherwise would be burned as waste, and biodegrades after one season. The team has demonstrated that the plants growing within it will be capable of reproducing the same conditions in a natural way and, after one year, the soil will be productive again.



The yareta plant (left) was the inspiration for the BioPatch (right).

The BioNurse team was inspired by the way that hardy "nurse" plants, like the yareta (a type of cushion plant) pictured below, establish themselves in degraded soils and pave the way for new plant species to grow. By mimicking biological principles, their design innovation provides a way to grow and protect new plants and ensure that the soil can be regenerated to feed our world's growing population.

<https://biomimicry.org/soil-restoration-innovation-wins-first-100k-ray-hope-prize>



## Botanizing the Web



In August 2016 without prior notice or due process—the Ecuadorian Police evicted all of the inhabitants of the Nankints Shuar community in the Morona Santiago province in the Ecuadorian Amazon. A mining camp for a proposed Chinese-funded copper mine project was then established on the site. The Shuar people are fiercely opposed to this and any other mining projects in their territory. The community of Nankints had been established by the Shuar specifically to protect this part of their ancestral lands from any kind of mining activities. What can you do? Read more and use your voices.

[https://www.pachamama.org/news/the-new-threat-of-mining-in-shuar-territory?utm\\_source=hs\\_email&utm\\_medium=email&utm\\_content=43298115&\\_hsenc=p2ANqtz-\\_fmzy9gxBQzxUr1eBjcY-qE7WDcZJmK6PIIBHbTZkExveDNhAxBDPSjtmCodSWy4gVn110ZMxVkrVuXsqs\\_AV-Z9lsL-dRqR2dpb6RuES8NQFqmi8g&\\_hsmi=43298115](https://www.pachamama.org/news/the-new-threat-of-mining-in-shuar-territory?utm_source=hs_email&utm_medium=email&utm_content=43298115&_hsenc=p2ANqtz-_fmzy9gxBQzxUr1eBjcY-qE7WDcZJmK6PIIBHbTZkExveDNhAxBDPSjtmCodSWy4gVn110ZMxVkrVuXsqs_AV-Z9lsL-dRqR2dpb6RuES8NQFqmi8g&_hsmi=43298115)

### Wild plant harvesters gain insights from a successful cooperative model in Viet Nam

© TRAFFIC, Bac Kan, Viet Nam, January 2017  
— TRAFFIC is working to increase the capacity of collectors of wild medicinal and aromatic plants (MAPs) in Bac Kan Province to protect biodiversity and improve local livelihoods. To achieve these outcomes, TRAFFIC, the Bac Kan Forest Protection Department (FPD) and two



local pharmaceutical companies assisted the local harvesters to establish collector groups and cooperatives in Bac Kan. TRAFFIC is now expanding the knowledge of these collector organizations through training sessions and by learning from other successful models.

To gain insights on how successful and sustainable cooperatives operate, 16 participants from collector organizations and six Forest Protection Department (FPD) staff went on a visit to the company Sapa Napro in the Lao Cai Province in December.

## Educational Tools

### Biomimicry for K-12 teachers

We created this free publication to help youth educators establish a general foundation in biomimicry and provide suggestions and resources for introducing the core ideas to students of varying ages. Download the PDF from our Resource Library on AskNature.org. (Note: a free user account is required.)

Learn how to apply biomimicry to any challenge, whenever and wherever you are. In this self-paced, online course, instructor Denise DeLuca will show you a step-by-step method for turning nature's strategies into innovative solutions for human problems. You'll not only learn the "what" and "why" of biomimicry, you'll learn how to apply the Biomimicry Design Spiral to solve technical and non-technical problems.

Contact the Biomimicry Institute:  
[hello@biomimicry.org](mailto:hello@biomimicry.org)

**Continued on page 12**



## Teaching Tuesday Workshops

*continued from page 7*

### 5. Traditional wheat and homemade couscous in Trás-os-Montes: local knowledge and skills of cultural significance (1-½ hrs; limit 10)

Isabel Sá, Associação ALDEIA, Bragança Portugal

**Short Description:** Participants will deal with couscous traditional manufacture. In Trás-os-Montes, wheat was a multipurpose crop of great importance for households, supplying straw, grain, and other surpluses. Seeds used for food and fodder were also sold for extra income. White flour was celebrated in many traditional receipts, such as the homemade couscous.

**Learning Objectives:** To illustrate specific facts about traditional wheat and couscous; to summarize particular terminology and processes; to apply specific techniques to produce traditional couscous; to discuss the importance of local culture and ethnobotanical contributions to conservation strategies of biocultural patrimony.

**Presentation Description:** The workshop focuses on local knowledge, resources and practices as the basis for conservation sustainable strategies. Moreover, it also intends to raise awareness about Trás-os-Montes (Portugal) biocultural heritage, improving its value and recognition.

Briefly, learning objectives are to understand the process of transformation of wheat flour into traditional couscous; to apply most important practices to prepare couscous and, by means of this simple process, to discuss rural populations' contributions to local knowledge transmission and resources conservation (e.g. biological resources as well as information, practices and culture).

This workshop will start with a short presentation contextualizing regional wheat production over time and the relevance of local varieties. Then it will consist of performing the following tasks inherent to the couscous making process:

- 1) Identifying plant materials, tools and techniques needed. Learning different steps and local terminology
- 2) Preparing processes and tools
- 3) Twisting the couscous until the flour obtains the consistency of small granules
- 4) Cooking technique
- 5) Drying process
- 6) Sharing knowledge: attendees interacting with local partner

Finally, attendees will be asked to compare characteristics of traditional knowledge across cultures, using their own background and to discuss how to

improve knowledge transmission having in mind sustainability, resource management and conservation, strategies. ALDEIA: <http://www.aldeia.org>

MEMORIAMEDIA e-Museu do Património Cultural Imaterial: <http://www.memoriamedia.net/index.php/en>

ALDEIAS DE PORTUGAL: <http://www.aldeiasportugal.pt/>



**Photo 1:** Traditional *Cuscus* of Trás-os-Montes. © Isabel Sá

### 6. Workshop on the Book Series *Advances in Economic Botany*, (1-½ hours; limit 20)

Michael Balick, Ina Vandebroek, Brian Boom

*Advances in Economic Botany* (<http://www.nybgpress.org/Products/CategoryCenter/BIS!AEB/advances-in-economic-botany.aspx>), published by The New York Botanical Garden Press is an interdisciplinary book series designed to disseminate current thinking and studies integrating basic and applied research related to plants and people. The broad readership of *Advances* includes policy makers, teachers, researchers, and students in the fields of agronomy, anthropology, biology, ecology, economic botany, ethnobotany, geography, and pharmacology. During this workshop, the moderators will introduce and review the history of this series, reflect on its future directions, and seek ideas for new publications. Participants in this workshop will engage in discussions about the state of knowledge of the field of economic botany, and the type of output (conference proceedings, books or dissertations) the readership would find most useful for this publication series. *Advances* is actively recruiting new manuscripts that reflect the current and future fundamental issues addressed by this dynamic and multidisciplinary field of research. Participants in this workshop will have the opportunity to help determine the trajectory of this series, which in 2017 marks its 33<sup>rd</sup> year of publication.

### 7. Portuguese Ethnobotany – Material Culture (1 ½ hours; limit 20)

Luis Mendonça de Carvalho, Botanical Museum | Museu Botânico, Polytechnic Institute of Beja, Portugal

**Intended Audience:** Informal Education

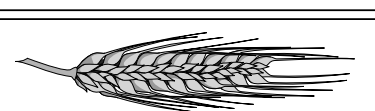
**Learning Objectives:** Identify some objects characteristic of Portuguese Ethnobotanical Heritage; Comprehend how natural resources determine ethnobotanical material culture.

**Ethnobotany's Core Concepts:** Diversity, Connections

**Ethnobotany's Core Concepts:** Bridging Skills, Interview & Fieldwork Skills

**Presentation Description:**

The participants will have to chance to study circa 40 artifacts and natural products that are typical of Portuguese Ethnobotanical Heritage (including Madeira and Azores islands). They will have the opportunity to understand which natural resources are behind the artifacts as well data related with the history, traditions and uses of these objects. Some of the objects can be seen at [www.museu-botanico.com](http://www.museu-botanico.com)



## 2017 SEB Meeting

*continued from page 3*

### HOW TO GET THERE:

Bragança, a small city of 25,000, established in 1187, is one of the eight Portuguese historical cities. For the exact location of the venue, visit <http://esa.ipb.pt/seb2017/en/>.

THE TIME IN PORTUGAL IS GMT UTC +0  
See <https://www.timeanddate.com/>

Bragança, and the IPB Campus are located about 2.5 hours away from the Francisco Sá Carneiro Airport in Porto, Portugal, about 3.5 hours away from Barajas Airport in Madrid, Spain, and several hours from Lisbon.

The organization has arranged for shuttles from the nearest airports in Porto and Madrid leaving from: **Lisbon:** there are no SEB transfers but if you want to visit southern Portugal and then have transport as part of the field trip back to Lisbon you can check <http://esa.ipb.pt/seb2017/en/transportes/>

**Francisco Sá Carneiro Airport in Porto:** Saturday, **June 3 at 6:00 pm** and on **Sunday, June 4 at 4:00 pm** (Portuguese Local time).

**Barajas Airport in Madrid, Spain:** Saturday, **June 3 at 6:00 pm** and on **Sunday, June 4 at 5:00 pm** (Spanish Local time). Bragança to Francisco Sá Carneiro Airport in Porto on Friday, June 9 at 8am (Portuguese Local time).

Bragança to Barajas Airport in Madrid, Spain on Friday, June 9 at 8am (Portuguese Local time).

### PLEASE NOTE THAT:

- If there is sufficient demand we may provide extra shuttles
- The final schedule will be announced later by email and at our website
- The cost for the shuttle two ways is 30 euros. See [econbot.org](http://econbot.org) registration to pay in advance

### BUS CONNECTION

There are multiple connections for bus transportation available daily from Lisbon, Porto and other cities in Portugal to Bragança.

**Bus Company Rede Expressos:** timetables and tickets on-line at <http://www.rede-expressos.pt/default.aspx>

**Bus Station in Porto:** R. de Alexandre Herculano 366, 4000 Porto, nearby Praça da Batalha.

**Bus Station in Lisbon:** Terminal Rodoviário de Sete Rios, Praça Marechal Humberto Delgado – Estrada das Laranjeiras 1500-423 Lisboa, nearby the Zoo.

## Global Meetings

*continued from page 1*

### XXIst International Congress “Phyto-pharm 2017” and 10th Anniversary of the TCM Research Center Graz July 2-5, 2017

[www.doclinika.ru/phyto2017.html](http://www.doclinika.ru/phyto2017.html)

#### Major Topics:

- Medicinal plant products: challenges, safety and efficacy
- Quality control of natural medicinal preparations
- Best practices in traditional medicines research
- TCM herbal medicine research
- TCM acupuncture research
- Systems biology based medicinal plant research
- Technology of natural medicinal products
- Advances in clinical studies of phytotherapeutics
- Regulation of herbal medicinal products and food supplements in Russia, the European Union, China and the USA

Language: English

#### Organizers:

- St. Petersburg Institute of Pharmacy, Russia
- Karl Franzens University of Graz, Austria
- Medical University of Graz, Austria
- Traditional Chinese Medicine Research Center, Graz, Austria
- State Chemical Pharmaceutical Academy, St. Petersburg
- Institute of Nutrition of the Russian Academy of Medical Science, Russia
- Society for Medicinal Plant and Natural Product Research (GA)



#### TRAVELLING BY CAR

By highway, Bragança is 215 km east of Porto and 520 km north of Lisbon.

• Porto - Bragança - 315 km | 2h30min  
 • AA Porto/Aeroporto - IPB - Avenida V. da Real - AA V. da Real/Bragança  
 • Lisboa - Bragança - 491 km | 3h30min  
 • AF - AF 1201/1910 - AA Lisboa - Terminal Novo - Alameda - Rua de Marquês de Cavaleiros - Bragança  
 • Madrid - Bragança - 367 km | 2h25min  
 • ADN V. da Real - Terminal - P122/161 Terminal/Barcelos/Matias - IPB Bragança  
 • Valladolid - Bragança - 284 km | 2h30min  
 • A421/100 - Valladolid Terminal/Barcelos - Terminal/Barcelos/Matias - IPB Bragança  
 • Salamanca - Bragança - 199 km | 1h45min  
 • R110 - Salamanca/Terminal/Barcelos - IPB Bragança  
 • Zamora Bragança - 197 km | 1h35 min  
 • R21 - Zamora/Barcelos - IPB Bragança

For more details, please visit our website, <http://esa.ipb.pt/seb2017/en/>  
We look forward to meeting you in Bragança, Portugal!

## Bioneers 2016

I attend this meeting annually because as a scientist, it “WOWs” me. There are some amazing creative scientists who present and take my creativity to another level. Please take a look at their website. That covers Mark Plotkin’s presentation at the 2016 annual Bioneers meeting and the Biomimicry Ray Anderson Ray of Hope Award (see page 8).

Bioneers is proud to be partnering with the Grand Canyon Trust as they host the first ever “Indigenous Peoples’ Gathering for Healthy Communities, Culture and Climate” at the Pueblo of Pojuaque, Nov. 6-9. Together, we share a vision of bringing together tribal leaders to share indigenous approaches to solving environmental and social issues through respectful dialogue.

The seeds for this partnership were sown in 2011, when delegates from the Grand Canyon Trust presented at the Indigenous Forum at the Bioneers Conference. Since then, our organizations have worked together, along with the Cultural Conservancy, under the generous support of the Christensen Fund and other private donors who understand the critical importance of maintaining networks for the ongoing stewardship of tribal lands.

Our partnership in this upcoming Intertribal Gathering represents the first time Bioneers has participated in an external event developed primarily by and for indigenous stakeholders. We are looking forward to this groundbreaking event and continuing to promote the incredible work of the Grand Canyon Trust, whose intergenerational activities, workshops and programs perpetuate Native languages and promote self-representation, while addressing critical environmental issues and indigenous rights.



Richard Plotkin, speaking.  
[www.bioneers.org](http://www.bioneers.org)

## 9th meeting of Ethnobiology and Ethnoecology—Northern Brazil

November 1-5, 2017 ☞ <http://www.ixenee.org/>

## 2017 Post-Meeting Field Trip

A SEB 2017 New Field trip added Before you make your final plans check this opportunity out for a post meeting trip.

We are excited to offer you a unique SEB field trip that compliments the meeting's symposia on cork. The trip will begin early June 9th to transport you two hours east of Lisbon to the cork growing and processing area where you can visit and see *Quercus suber* in its natural habitat. The location is in the Alentejo region of Portugal where our hosts have resided for over five generations. The 540-hectare farm and 200-year-old farmhouse was built in the traditional style overlooking the surrounding countryside, was dedicated to the cork forestry.

In addition to the cork tour, there will also be harvest viewing, transportation, lodging, meals, and opportunities to visit many surrounding sites, making this the perfect trip. If the one day is your goal, then on June 10 or June 11, we can simply get you transported to the Lisbon airport for your departure.

This special tour, all inclusive, is €350, 2 days, 2 nights, transportation, 3 meals. If you have your own transportation it is €200 / Person

Other field trips Wednesday, June 7, from 9am to 7pm (lunch included) are listed on the meeting site: <http://esa.ipb.pt/seb2017/en/visitas-de-estudo/>



## Opportunities ....

*continued from page 7*

### Grant

I know this is past deadline, but I place it in here for people to be aware of 2017 opportunities.

The National Climate Change and Wildlife Science Center is soliciting Statements of Interest from graduate students interested in the 2017 Science to Action Fellowship. The fellowship provides \$10,000 in funding support and an opportunity for students to work closely with USGS staff and partners to develop a product that supports climate change decision-making. Statements of Interest are due December 15, 2016.

### Eligibility:

The program is open to Master's and Doctoral students at any Climate Science Center consortium institution. Students must be enrolled at the institution for the entire fellowship year. See the list of consortium institutions here: <https://nccwsc.usgs.gov/csc-universities-and-consortia>

### More Info on the Fellowship:

<https://nccwsc.usgs.gov/content/application-period-closing-2017-science-action-fellowship>

## Botanic Gardens Conservation International—[www.bgci.org](http://www.bgci.org)

BGCI would like to invite you to join the Let It Grow campaign and take part in an **international day of action on World Biodiversity Day, 22 May 2017** to highlight to the potential of botanic gardens, zoos, aquaria and science centres to support the delivery of the European Union Biodiversity Strategy.

In the mid-term review of the European Union Biodiversity Strategy, the European Commission identifies barriers to the implementation of the strategy and recommends actions needed to overcome them. The conclusion of the report states: Since last year, BGCI, the European Association of Zoos and Aquaria (EAZA) and the European Network of Science Centres and Museums (Ecsite) have been collaborating on a campaign to promote European biodiversity awareness and conservation. This campaign, called Let It Grow, represents an important contribution towards the unification of public engagement efforts across the leading science engagement facilities in Europe.

The Let It Grow coalition is uniquely placed to assist the European Union to achieve the implementation of the EU Biodiversity Strategy. The campaign recognizes that despite significant efforts by Member States to educate citizens on the concepts of biodiversity and biodiversity loss, a significant proportion of people across the EU

still have little awareness these concepts, and few avenues to help stem biodiversity loss.

Following the recommendations of the mid-term review, we therefore propose a considerably bolder and more ambitious approach to reaching the 2020 targets: namely the establishment of a strong partnership between the European Union and the Let It Grow coalition to engage communities with the Strategy and its targets.

Engagement by our Members will also help address Headline Target 14 of the Parliamentary Resolution on the mid-term review of the EU Biodiversity Strategy 2020. It calls for a multi-stakeholder approach and stresses the vital role of national, regional and local actors, and of their full participation in this process; stresses that funding and greater public awareness and understanding of, and support for, biodiversity protection are also essential and UN Sustainable Development Goal 15. Goal 15 is to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss.

The Let It Grow coalition proposes to demonstrate the potential strength of this partnership through a series of events held across Europe on World Biodiversity Day, 22 May 2017. Our Members will conduct a variety of citizen engagement actions aimed at significantly improving public and business awareness of biodiversity and biodiversity loss and encouraging them to take action to help protect native species in their communities.

**Getting involved is really easy.** Simply join the campaign by signing up on the Let It Grow website, then start planning your activity for May 22. Activities may include, a workshop about gardening with native species, a bioblitz, a lesson about making bug hotels or a tutorial about how to make a garden appealing for pollinators. The activities can be very varied but should have a focus on European biodiversity and the Biodiversity Strategy.

Make sure you use the Let It Grow logo to highlight this new collaboration between botanic gardens, zoos, aquaria, and science centres!

Any questions email [Liliana.derewnicka@bgci.org](mailto:Liliana.derewnicka@bgci.org)



## Botanizing the Web

*continued from page 8*

Founded in 2006 by Mr. Ly Lao Lo, an ethnic Dao of Lao Cai Province, Sapa Napro processes and trades local cultivated MAPs to generate income for the cooperatives who work within the company. Locals of the province can become cooperative members by contributing money or resources. The revenue is then divided into three channels: 40-50 percent goes to reinvestment, 40-45 percent is distributed to cooperative members, and 10-15 percent is allotted to a community fund. This successful model is improving the livelihoods of cooperative members in Lao Cai province and promoting benefit-sharing mechanisms within their communities. Through their operations, they contribute to local economic growth and the conservation of provincial resources.

“This trip was a great way to expand the knowledge of collectors in Bac Kan Province. We have been working with collectors to improve their livelihoods and ensure that wild MAP harvesting does not harm biodiversity. These collectors and FPD staff are learning about sustainable models that benefit the people who rely on plant species to make a living. They are now showing these techniques to their colleagues in Bac Kan,” said Madelon Willemssen, Head of TRAFFIC in Viet Nam.



© TRAFFIC/FPD staff learned ways to provide technical support to collector cooperatives and groups. The wild MAP collectors who went on the trip were able to do first-hand observations of cooperatives that work for Sapa Napro to see how they negotiate and improve their access to the market.

Participants expanded their knowledge on marketing through different channels and via face-to-face interactions with pharmacists. They also learned how to expand and maintain membership in their

cooperatives and collector groups. Sapa Napro and the collectors in Bac Kan province discussed the challenges of retaining members in their cooperatives and groups. They discussed how to increase member retention by illustrating the benefits of working together and creating a community fund to use in their localities.

The head of Xuan Lac Cooperative, Mr. Nong Van Huong said, “I think this event was a good opportunity to exchange our experiences in MAP wild-collection and the lessons learned from business operations. We can see similarities between the workings of this company and how our cooperatives and groups are run. I think this trip will improve how we conduct our operations and increase market access for Jiaogulan and other products.”

With funding from the Darwin Initiative, TRAFFIC is giving collectors in Bac Kan Province the know-how and experience to improve their livelihoods and preserve local biodiversity. This trip is a unique way of showing wild MAP collectors how they can benefit from cooperative action and sustainable management of plant species. The trip was made possible through the Darwin Initiative project, “Enhancing management and benefit flows in Vietnam’s wild medicinal plant products,”

which is funded by the U.K. government. TRAFFIC supports the MAP wild-collectors in Bac Kan with know-how and skills development to improve their livelihoods and preserve local biodiversity.

For further information, contact:  
Ms. Thuy Nguyen, Program Officer for TRAFFIC in Viet Nam  
Email: [thuy.nguyen@traffic.org](mailto:thuy.nguyen@traffic.org)  
Mr. Nikolas Veinot, Communications Officer for TRAFFIC in Viet Nam  
Email: [nikolas.veinot@traffic.org](mailto:nikolas.veinot@traffic.org)

## Politics

SEB is not a political organization and takes no part in politics, but this year we have some changes in the US raise concerns. As the Editor, I encourage you as Multidisciplinary Scientists from all over the world to remain vigilant and secure scientific rigor whenever possible. Question and confirm. The March in Washington, D.C. for Scientists is April 22, 2017 <https://www.marchforscience.com/>

### **An Excerpt from NSC Alliance Washington Report, Volume 7, Issue 11, November 21, 2016 Policy News from NSC Alliance**

Through the NSC Alliance partnership with the American Institute of Biological Sciences, we are pleased to provide NSC Alliance members with the following public policy update. With proper attribution to NSC Alliance, all material from these reports may be reproduced or forwarded. **We encourage you to share this report with colleagues at your institution. Anyone interested in receiving copies of the NSC Alliance Washington Report may subscribe at [www.NSCAlliance.org](http://www.NSCAlliance.org) — it’s free!**

If you have any questions or require additional information regarding any of the following items, please contact NSC Alliance director of public policy Dr. Robert Gropp at 202-628-1500 x 250 or at [rgropp@aibs.org](mailto:rgropp@aibs.org).

### **Trump Presidency Could be a Significant Change for Science**

President-elect Donald J. Trump is a bit of an enigma on science, in part because the campaign was short on policy discussions. The only information about his views on research was provided in response to 20 questions posed by Science Debate, which the Natural Science Collections Alliance helped to prepare.

Trump’s responses were peppered with positive statements, such as “scientific advances do require long term investment,” and “though there are increasing demands to curtail spending and to balance the federal budget, we must make the commitment to invest in science, engineering, healthcare and other areas that will make the lives of Americans better, safer and more prosperous.”

But these sentiments were seemingly contrasted by other responses. “In a time of limited resources, one must ensure that the nation is getting the greatest bang for the buck,” Trump wrote. “We cannot simply throw money at these [research]

**Continued on page 13**

## Politics

*continued from page 12*

institutions and assume that the nation will be well served. What we ought to focus on is assessing where we need to be as a nation and then applying resources to those areas where we need the most work. Our efforts to support research and public health initiatives will have to be balanced with other demands for scarce resources.”

Of note for the scientific community, however, was a reinvigorated skepticism of climate science: “There is still much that needs to be investigated in the field of ‘climate change.’” When asked about the rapid loss of biodiversity, Trump responded about overreach of unelected officials writing regulations. His response on maintaining American leadership in innovation focused on the role of businesses and ignored the fact that the federal government is the largest provider of funding for basic research.

Trump has previously called for taxes to be lowered and for non-defense spending to be cut. The nonpartisan Center on Budget and Policy Priorities calculates that by the tenth year of Trump’s plan, non-defense spending would be 29 percent lower than current levels, after accounting for inflation.

Some experts, however, urge caution in reading too much into Trump’s prior statements.

“As someone who spent 15 months researching Trump’s past statements, if anyone says they know what a President Trump will do they’re lying,” tweeted CNN reporter Andrew Kaczynski.

As President, Trump could look to increase spending on infrastructure and the military, and building a wall along the Mexican border. Congress, however, may be a roadblock to significant new spending.

According to Representative Dave Brat (R-VA), a member of the conservative House Freedom Caucus: “Yes, there is an inevitable clash on fiscal issues because of the leadership we’ve had over the past 20 years who have led us into \$19 trillion in debt. Right now, there are no easy answers. And I will continue to push everyone to define pay-fors [spending offsets] on everything moving forward.”

One possible source of savings is a hiring freeze in the federal government. President-elect Trump

wants to reduce the size of the federal workforce through attrition. “This is a road that many prior presidents have been down, without success,” said Max Stier, president of the Partnership for Public Service. The federal workforce is currently about the same size it was during the early 1960s at 2.1 million civilian employees.

### 115th Congress Will Have Many Familiar Faces

In spite of fundamental political change coming to the White House, Congress will largely be unchanged for the next two years. Last week’s election resulted in very few congressional seats changing parties. The Democrats picked up two seats in the Senate (New Hampshire and Illinois) and at least six seats in the House of Representatives. Republicans retain majorities in both chambers, although with smaller margins.

Seven new members will join the Senate. Six have already won their races. The results of the Louisiana race will be determined in a runoff election in December, but neither candidate is an incumbent. More than 50 new members will join the House.

The freshman class of the 115th Congress adds some diversity to the body. Among the freshmen members is the first Hispanic woman elected to the Senate, Catherine Cortez Masto (D-NV). Lisa Blunt Rochester (D-DE) will be the first woman and the first African-American to represent Delaware in Congress; only two other states have never elected a woman to Congress. The number of female Senators will reach a record high of 21. A record of 48 African-Americans and 39 Hispanics will serve in the 115th Congress.

Committee leadership will largely remain the same, especially for many of the committees with jurisdiction over science. The leadership of the House and Senate Agriculture Committees; the House Natural Resources Committee; the Senate Commerce, Science, and Transportation Committee; and the Senate Energy and Natural Resources Committee will likely not change.

Representative Lamar Smith (R-TX) and Eddie Bernice Johnson (D-TX) will stay on as leaders of the House Science, Space, and Technology Committee. Long-time committee member Randy

Neugebauer (R-TX) is retiring. Two Democrats on the panel lost primary races for Senate seats and will be leaving Congress. There may be other turnover in committee membership, as the panel is one that most lawmakers are eager to leave in pursuit of more powerful committees.

Ranking Member Johnson pontificated that Chairman Smith may change gears during Trump’s presidency. “He’s primarily been focused on investigating the Obama Administration over the past couple of years, using his expanded subpoena and deposition powers. I would imagine that there will be much less interest on his part in carrying out a similar investigative agenda against a Trump Administration. I thus am hopeful that the Chairman will return the Committee to a constructive legislative agenda that advances our nation’s research, development and innovation enterprise.”

The House Appropriations Committee will have new leadership. Current chairman Hal Rogers (R-KY) is facing a term limit of six years per Republican caucus rules. Representative Rodney Frelinghuysen (R-NJ)—the current chair of the Defense Subcommittee—is likely to be promoted to full committee chair. This could cause a ripple of changes in the leadership of other subcommittees. It is speculated that John Culberson (R-TX) will remain at his current post leading the Commerce, Justice, Science Appropriations Subcommittee. The ranking member of that panel, Mike Honda (D-CA) lost his race for reelection and a new Democratic leader will need to be selected.

In the Senate, Thad Cochran (R-MS) is likely to stay on as chair of the Appropriations Committee. Senator Patrick Leahy (D-VT) will likely succeed the retiring Barbara Mikulski (D-MD) as Ranking Member. Mikulski also served as ranking member of the subcommittee with jurisdiction over science. Senator Diane Feinstein (D-CA) is rumored to be interested in the position. One committee member, Mark Kirk (R-IL), lost his reelection.

Senator John Barrasso (R-WY) will likely be the new chair of the Senate Environment and Public Works Committee. The current chair, Jim Inhofe (R-OK), is term-limited. The ranking member slot is also open due to the retirement of Barbara Boxer (D-CA).



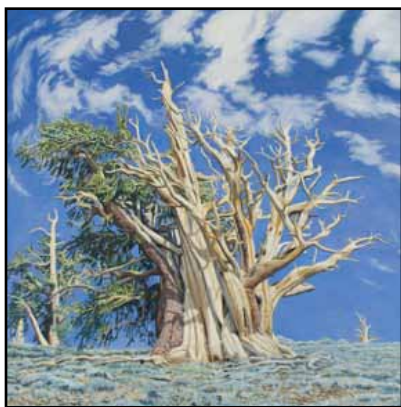
## Publications and Presentations

Science Publishing Group, SPG, is an open access publisher that publishes scholarly journals. We sincerely invite you to become our client and submit papers to our journals.

### Some Journals for Your Reference

- Journal of Food and Nutrition Sciences
- Journal of Water Resources and Ocean Science
- Cell Biology
- Journal of World Economic Research
- Advances in Applied Sciences
- Science Journal of Education

If you are interested in more journals, please visit: <http://www.sciencepublishinggroup.com/journal/journalist?email=tfastersprint@earthlink.net&et=SPG&dt=20160831>.



### Intermountain Flora Volume 7: *Potpourri: Keys, History, Authors, Artists, Collectors, Beardtongues, Glossary, Indices*

By Noel H. Holmgren and Patricia K. Holmgren

NYBG Press is pleased to offer the 7th volume of the Intermountain Flora series, *Potpourri: Keys, History, Authors, Artists, Collectors, Beardtongues, Glossary, Indices*, by Noel Holmgren and Pat Holmgren. Included in this ninth part of the series is an update to the 1984 treatment of Intermountain Penstemon, published in volume 4, keys to families represented in Intermountain Flora, a cumulative index for all seven volumes, and a history of the project that includes photographs of authors, artists, and plant collectors of the Intermountain West.

February 2017 | cloth | 7.5" x 10.625" 4 color | 312 pp. | 532 images 6 figures | no. 5464 | US \$119

### Agaricus of North America

By Richard W. Kerrigan

NYBG Press is pleased to announce the availability of *Agaricus of North America*, by Richard W. Kerrigan. This volume, which is the result of 45 years of work by the author, will serve as an authoritative yet accessible sourcebook for the specialist and interested amateur alike. Filled with nearly 300 color images to help identify 180+ species, Kerrigan provides "how" and "why" explanations with technical details in a simple layout that offers clear descriptions and notable features for each species treated.

Kerrigan's unique perspective combines an evaluation of *Agaricus* diversity in natural ecosystems, supported by modern and historical collections, with technical descriptions either from his own notes or from herbarium collections.

2016 | hc | 592 pp. | 294 color images | 15 b&w images  
76 tables | order no. 5365 | US \$127.99

### ABOUT RICHARD W. KERRIGAN

Richard W. Kerrigan was born and raised in California. He became interested in *Agaricus* in 1971, while an undergraduate at the University of California, Santa Cruz. He earned a doctorate from University of California, Santa Barbara (1989). His mentors include David Arora and Dr. Harry Thiers. Since 1993, Kerrigan has held the position of Director of Research, U.S.A., with Sylvan Inc., the world's leading producer of cultivated mushroom spawn, where he works on breeding improved strains of cultivated mushrooms. His study of the diversity, taxonomy, systematics, and phylogeny of wild species of *Agaricus* continues as a separate, independent area of research now extending over 45 years.

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### Maps, Medicine, & Magic in the Rainforest Ethnobotany Keynote Video Goes Viral

Mark Plotkin, groundbreaking ethnobotanist and author of "Tales of a Shaman's Apprentice," works closely with indigenous peoples and uncontacted tribes to map, manage, and protect more than 70 million acres of ancestral forests in northwest Amazon. Mark shared this work with over 2,000 people at the 2016 Bioneers Conference – but the video excerpt of his keynote (on why ethnobotanists don't read science fiction) has reached over half a million viewers on Facebook!

### African Journal of Traditional, Complementary and Alternative Medicines

(AJTCAM) has just published its latest issue at <http://journals.sfu.ca/africanem/index.php/ajtcam>. We invite you to browse the Table of Contents of Vol. 14, No. 1 (2017) here (<http://journals.sfu.ca/africanem/index.php/ajtcam/issue/view/120>) and then visit our website to read articles and items of interest.

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### There is a current release of the book

#### *Divine Farmer's Classic Materia Medica*

The Chinese Medicine Database has proudly announced the release of the *Reading of the Divine Farmer's Classic of Materia Medica*, by Chen Xiuyuan. The text, which was written by the famous Confucianist and medical doctor Chen Xiuyuan (1753 – 1823 in Fu Jian), was first printed in 1803. The original text of the Shen Nong Ben Cao Jing (Divine Farmer's Classic of Materia Medica) was compiled in the first or second century A.D. There are 365 herbs described in the Shen Nong Ben Cao Jing. In the subsequent translation, there are 116 medicinals that have been excerpted from the original, and 46 from later appendices. The *Reading of the Divine Farmer's Classic of Materia Medica* includes commentaries by Chen Xiuyuan, Zhang Yin'an, and the scholar-physician Xu Ling-tai, whose commentary on the Divine Farmer's Classic of Materia Medica was first published in 1736. While this is the second full book release of one of Chen Xiuyuan's books, the Chinese Medicine Database hopes over time to get his whole life works translated. Copies of the text can be purchased at [http://www.cm-dbcart.com/product\\_p/snbcjd.htm](http://www.cm-dbcart.com/product_p/snbcjd.htm).



## Sustainability Efforts in the News

### News

5@5: White House takes steps to address soil sustainability. Will gac fruit find traction in the U.S. market?

Each day at 5 p.m., we collect the five top food and supplement headlines of the day, making it easy for you to catch up on today's most important natural products industry news.

### Dec 06, 2016: The Obama Administration Announces New Steps to Advance Soil Sustainability

The White House Office of Science and Technology Policy has released a federal framework for soil science developed with a dozen other agencies and with input from academia and industry. The framework is intended to inform the future development of a comprehensive federal strategic plan for soil science and pinpoints five priorities for supporting and expanding research in soil sciences. A number of agencies have also committed to expanding their research and conservation initiatives.



### FACT SHEET

Today, the White House Office of Science and Technology Policy (OSTP), in collaboration with agencies and private-sector stakeholders, is announcing new steps to work towards the long-term health and sustainable use of one of America's most important natural resources: its soil. OSTP is also releasing today a Federal framework for soil science, developed in collaboration with more than a dozen Federal agencies, with input from approximately 80 stakeholders from academia, industry, non-profit organizations, and the agricultural community.

Soil is essential to human life. Not only is it vital for providing most of the world's food, but it also plays a critical role in ensuring water quality and

availability; supports a vast array of non-food products and benefits, including mitigation of climate change; and sustains the biodiversity needed for ecological resilience. These roles make soil essential to modern life. Thus, it is imperative that everyone—city dwellers, farmers and ranchers, land owners, and rural citizens alike—take responsibility for caring for and investing in our soils. Given their importance, soil must be protected from degradation, as the alternative is the loss of an array of important ecosystem services.

The new actions being announced today aim to advance scientific understanding of soils so that land managers and farmers are better able to care for them and maintain their ability to support food security, climate mitigation, ecosystem services, and public health. These actions focus on three key areas:

1. Promoting interdisciplinary research and education, to answer key questions on rates of soil genesis and erosion, the role of soils in bioenergy production, the development of

advanced soil sensors, and research to better understand non-agricultural soils.

2. Advancing computational tools and modeling, to improve analytical capacity and develop a robust predictive framework in studying soil properties, including pursuing a more sophisticated understanding of soil-carbon fluxes and the potential for soil-carbon sequestration.
3. Expanding sustainable agricultural practices, to ensure farmers and ranchers have the information and tools they need to protect and enhance agricultural soils and ensure global soils can continue to provide food security and climate benefits for future generations.

The projects in this Fact Sheet build on decades of experience, research, and conservation efforts of farmers, ranchers, and land owners, along with states and the Federal Government. Since the 1930s, when the onset of the Dust Bowl led to the creation of the Soil Conservation Service, federal agencies have invested tens of billions of dollars in soil conservation and research initiatives. During this Administration, land managers have increased the number of acres of farmland enrolled in the Department of Agriculture's conservation programs by nearly 200 million acres. Federal soil-science efforts are not limited to agricultural soils—across the Federal research enterprise, more than a dozen agencies work to protect soils in rangelands, cities, forests, coasts, and other areas—often working hand-in-hand with citizens, universities, local organizations, and other private-sector partners.

### New Steps Being Taken by the Administration

**Today:** To support the coordination of future government-wide science and technology efforts to protect soils, the National Science and Technology Council's Soil Science Interagency Working Group (SSIWG) is releasing today "The State and Future of U.S. Soils," a Framework for a Federal Strategic Plan for Soil Science, which is the result of a collaborative effort from more than 15 Federal agencies. In developing the Framework, SSIWG considered input from stakeholders from academia, industry, non-profit organizations, and the agricultural community who attended an OSTP workshop on soils in August 2016. The Framework is available for public comment until January 10, 2017. SSIWG intends to use it to inform the future development of a comprehensive Federal Strategic Plan for Soil Science.

The Framework sets forth the most important threats to U.S. soils and potential federal research priorities. It identifies three overarching "Challenge and Opportunity" categories: (1) land use and land cover change, (2) unsustainable land management practices, and (3) climate and environmental change. It also lists potential priorities for future federal science and technology efforts. In addition, several federal agencies are supporting the development of the Strategic Plan by expanding their research and conservation initiatives:

### Promoting Interdisciplinary Research and Education

- The Department of Energy's (DOE) **Pacific Northwest National Laboratory** will commit \$20 million in federal funds to soil research, \$10 million of which will be used to launch a new flagship soil-plant-atmosphere integrated research program.

## Sustainability

*continued from page 15*

- DOE's **Office of Science** will expand its Next-Generation Ecosystem Experiments to support a new research station in Alaska's Seward Peninsula to study soil carbon in permafrost regions.
- To support new biological and environmental research on soil, DOE's **Office of Science** is proposing an additional \$3 million over the next three years to support interagency research on soil carbon, and up to an additional \$5 million over the next year for research on watershed soil biogeochemistry.
- The Department of Agriculture's (USDA) **Agricultural Research Service (ARS)** is expanding investments in soil research over the next five years by increasing its investments in more than two dozen of their research programs related to soil science. These include efforts to address climate change and further develop ARS' Long-Term Agroecological Research (LTAR) network.
- **ARS** will also hire a National Program Leader for Soil Biology, into a newly created position to enhance the agency's research programs at the intersection of earth and life sciences.
- USDA's **National Institute of Food and Agriculture (NIFA)** will create opportunities for soil science funding by encouraging research in soil health in its Agriculture and Food Research Initiative's Education and Literacy Initiative, which funds graduate education and postdoctoral research.
- The **Smithsonian Institution** will develop new educational materials on preventing soil erosion for up to 6.5 million students; these materials will be included in its comprehensive Elementary curriculum called "Smithsonian Science for the Classroom" and will be distributed to 1,454 school districts in all 50 states.
- The **Smithsonian Institution** will also launch four long-term research initiatives focused on soil science:
  1. *Impacts of Soil Hydrology on Tree Biodiversity*: A new program to study the relationship between tree species diversity and soil hydrology, by wiring a tree experiment designed to operate for 100 years with sensors that link tree water demand to soil moisture.
  2. *Researching Soil Fungi to Conserve Orchids*: A new North American Orchid Conservation Center to establish an international program, and build an inventory of soil fungi collected across a gradient of disturbance.
  3. *Soils Supporting Estuaries*: A new research program, in collaboration with several universities, to understand how coastal marshes cycle atmospheric carbon dioxide

and how to represent the process in Earth system models.

4. *Soil Warming in Tropical Rainforests*: A new long-term experiment to help scientists forecast changes in tropical forest soil-carbon stocks as they continue to warm.

### *Advancing Computational Tools and Modeling*

- DOE's **Lawrence Berkeley National Laboratory** will invest \$450,000 to develop highly controlled environments that reproduce key parameters of agricultural ecosystems to better understand plant-soil-microbiome interactions. The Eco-FAB project will leverage synthetic biology tools to help prevent soil erosion, improve soil productivity, and support rural agricultural development.
- The **U.S. Geological Survey, Natural Resources Conservation Service, National Oceanic and Atmospheric Administration (NOAA), National Aeronautics and Space Administration (NASA)**, as well as state agencies, universities and the private sector are collaborating to develop and expand a National Soil Moisture Network. The goal of this network is to provide a product that represents real-time soil moisture across the United States using in situ, remote sensing and modeling information that can be used for research and monitoring on drought, agricultural productivity, and more.
- USDA's **Forest Service** will extend research efforts as part of its Forest Inventory and Analysis Program (FIA) to develop models integrating soil, climate, and geospatial data and to predict carbon stocks on forest land, and will publicly release long-term data from its soil and litter surveys. Additional research in this program will contribute to improved methods.

### *Expanding Sustainable Agricultural Practices*

- DOE's **Advanced Research Projects Agency-Energy (ARPA-E) and The Nature Conservancy (TNC)** will collaborate to advance soil health through a new Memorandum of Understanding to accelerate the research, development, and deployment of new innovations in soil-carbon and crop systems. Through shared technical expertise, knowledge and experience, this public-private partnership will focus on improving soil health to sequester atmospheric carbon and achieve clean and abundant water, improved crop yields, and sustainable production. TNC and ARPA-E will collaborate on two research programs: ROOTS (Rhizosphere Observations Optimizing Terrestrial Sequestration), which optimizes carbon storage in soils and crop roots, and TERRA (Transportation En-

ergy Resources from Renewable Agriculture), which uses breeding to improve crop yields.

- **USDA**, aiming to enhance soil-carbon sequestration and improve soil health, will expand and update its Soil Health Monitoring and Enhancement Network, and is establishing new guidelines for the use of cover crops as a soil conservation practice.
- USDA's **Natural Resources Conservation Service** will undertake new conservation initiatives, including expanded ecological site descriptions for agricultural soils across the Nation, national soil inventories in partnerships with the National Park Service, and research on soil organic matter in collaboration with universities across the Nation.

### **New External Efforts in Response to the Administration's Call to Action**

OSTP issued a call to action on August 1, 2016, calling upon academia, industry, nonprofits, farmers, and members of the public to establish new efforts to advance soil research and protect soil resources across the Nation. New actions being announced today in response to that call to action include the following:

### *Promoting Interdisciplinary Research and Education*

- **North Carolina State University (NCSU)**, in response to the nationwide decrease in numbers of trained soil scientists, will open its new Soil Science Institute in collaboration with NRCS, an initiative that builds on technical expertise and extension training programs within NCSU's Department of Crop and Soil Sciences.
- **Oregon State University**, acting through its College of Agricultural Sciences, will hire new faculty members in soil science and related disciplines, including three new positions related to soil quality. These new researchers will investigate: (1) the application of biochar from agricultural and forest byproducts to improve soil fertility, (2) the development of passive sensors to measure soil pollutants, (3) the use of solarization to reduce soil-borne plant pathogens, and (4) the role of the soil microbiome in maintaining soil health.
- **Texas A&M University and Texas AgriLife Research** will invest approximately \$200,000 per year in the development of its Soil Security Initiative, which will aim to deploy innovative systems for ensuring the long-term sustainability of global soil resources.
- **Union of Concerned Scientists** will expand its scientific research to develop new

**Continued on page 17**



## Sustainability

*continued from page 16*

interdisciplinary findings that investigate how agro-ecologically informed farming and ranching practices could build soil health and address challenges related to food, energy, and water systems. It will do this by conducting new studies evaluating how specific sustainable, diversified farming systems could help farms and ranches become more resilient to droughts and floods, contribute to climate change mitigation, and simultaneously address multiple food-system challenges.

- **University of Alabama (UA)** will, in collaboration with more than 15 organizations and cities, establish the Southern Urbanism and Policy Initiative, a new organization with a mission to develop innovative strategies to reverse soil loss and sustainably manage urban soil resources, and to develop new research efforts to scale and apply engineering- and science-based solutions to restore soil health in cities. UA will hire more than 50 new faculty members to engage in research areas related to the Initiative's work. The Initiative will lead partnerships and collaborations with the City of Tuscaloosa, the City of East Lake, the National STEM Collaborative, Alabama Water Institute, BioCycle, Detroit Dirt, Crabtree Group, Citizens Task Force, Eden Team LLC, LowCountry Alliance for Model Communities, Mouzon Design, West Alabama Food Bank, UA's School of Social Work, and NOAA's National Water Center. The Initiative will feature four main programs:
  1. The *Neighborhood Program*, dedicated to harnessing innovative urban planning and design to develop clean soil and water systems in southern cities, and improve soil health starting with efforts at the neighborhood scale.
  2. The *Living City Roots Initiative*, which aims to generate urban soils through new forms of composting and urban agriculture.
  3. The *Living City Water Initiative*, which focuses on developing mechanisms to improve water quality and efficiency in cities.
  4. The *Living City Thrives Initiative*, which will build partnerships with local communities and work to ensure inclusive alliance-building and social investment for long-term sustainable use of soil resources.

### *Advancing Computational Tools and Modeling*

- The **University of Arizona** will invest at least \$7.5 million in a decade-long experiment to understand the coupled mechanisms underlying the formation of soil from rock. The program will harness the Landscape Evolution Observatory's (LEO) research facilities at the University's BioSphere-2 center to conduct highly controlled studies on the in-

teractions among the microbial colonization, rock weathering, carbon sequestration, and hydrologic flow paths that arise during early stage of soil formation. The research will have applications for soil-carbon sequestration and improving soil fertility.

- **California State University, Chico** will develop a regional soil laboratory that focuses on reducing the cost of data development in a collaborative science/management model, to open within 18 months.
- **Colorado State University** will hire three new faculty members to complement the recent hiring of two new faculty members who are researching the soil microbiome in relation to cultivated and natural ecosystems. The University will also hire at least one new faculty member into the College of Agricultural Sciences whose work will focus on the intersection between big data and agriculture.
- The **National Critical Zone Observatory Program**, a network of geological and ecological research observatories funded by the National Science Foundation, will grow a new national research program on soils and water. This will include funding for a new postdoctoral associate and new research initiatives to develop models of soil formation from soil grain to landscape.

### *Expanding Sustainable Agricultural Practices*

- **American Farmland Trust** plans to work with agricultural partners in the Great Lakes basin over the next three years to implement new models for improving soil health, with a target of restoring 2.8 million acres of agricultural land (equivalent to 10.5 percent of the cropped lands in the Great Lakes basin). The program focuses on models for engaging non-operating landowners (particularly women) and farmer lessees, aiming to improve soil health practices on leased farmland, which accounts for 39 percent of the farmland in the contiguous United States.
- **Applied Ecological Services, Inc.** will work with farms in Washington, Oregon and Idaho to implement regenerative agricultural practices (including one-pass no-till farming, among others) with a goal of over 1 million acres of participating agricultural lands, with the aim of reducing erosion and nutrient runoff and improving soil fertility. The organization will also work to sequester 1 million tons of CO<sub>2</sub>-equivalent in soils over approximately 220,000 acres.
- The **Environmentally Defense Fund** will invest approximately \$1 million in new funds toward implementing science-based strategies for improving soil fertility, developing conservation planning strategies for soil, and

ending fertilizer pollution from soil runoff, as well as a business plan competition to build agriculture environmental data integration models that conserve natural resources while protecting farmer privacy.

- **Fall Line Capital** will invest a new \$200 million fund in an ambitious effort to reduce erosion and restore productivity on degraded agricultural land, aiming for no net loss of soil, to ensure fully productive farmland in perpetuity. This will be accomplished through the comprehensive use of agronomic best practices and investment in emerging agricultural technologies.
- **One Acre Fund**, a nonprofit social enterprise, will establish and invest approximately \$100,000 in a new research program with over 4,500 smallholder farmers in Kenya and Rwanda. The study's objectives will be to determine the long-term effect of different agricultural practices on soil health, to quantify the financial value of soil health for participating farmers, and to determine which products and practices most effectively improve soil health. The findings could improve soil health for the more than 364,000 smallholder-farmers that One Acre Fund currently serves in Kenya and Rwanda.
- **Patagonia**, in collaboration with **The Carbon Underground**, will work to restore soil health to 4 million acres of degraded agricultural land to ensure regenerative harvesting of organic cotton that also draws carbon down from the atmosphere to help reverse climate change. This effort will supplement their existing efforts regarding soil and climate change, including research on the Great Plains to demonstrate the impact of bison management on carbon drawdown, the production of educational materials on the relation between soil health and climate change, and the development of foods made from ingredients grown with regenerative agricultural practices.

### **The Future of Soil Resources in the United States**

In the United States, soil on cultivated cropland is being eroded at an estimated rate of 5.2 tons per acre per year, while the rate of soil formation averages approximately 0.5 tons per acre per year. In some parts of the Midwest soil erosion rates are double the national average, and extreme weather events can erode significant quantities of agricultural soil—in some states, erosion has been measured at over 100 tons per acre in a single storm. That means that a layer of soil that took over 350 years to form can be destroyed in one day.

**Continued on page 18**

## Sustainability

*continued from page 17*

Climate change is expected to increase pressure on soil as the frequency of extreme weather events increases, bringing more erosive rain that can accelerate soil loss.

Non-agricultural soils also face challenges. Many urban soils have been contaminated with lead or toxic substances, posing a threat to human health. In some cases, intensive forestry and rangeland practices have also resulted in release of substantial soil carbon into the atmosphere, slowing progress toward tackling climate change. A further challenge has been the deposition of atmospheric pollutants in forests, which has leached essential nutrients from forest soils in many parts of the Nation.

The actions announced today were developed in response to dynamic challenges and new opportunities in soil health. Advances in science and technology—including in information technology—are creating unprecedented opportunities for intelligent and responsible management of natural resources. These actions represent steps toward a more sustainable and resilient future.

### American Botanical Council Press Release Feb 14, 2017

[www.herbalgram.org](http://www.herbalgram.org)

WASHINGTON – Today, **U.S. Representative Mike Quigley (IL-05), Vice Chair of the Sustainable Energy & Environment Coalition**, introduced the Botanical Sciences and Native Plant Materials Research, Restoration and Promotion Act to support the botanical science capacity of the federal government.

“Botanical knowledge impacts our lives in more ways than most Americans realize. From combating climate change and enhancing food security to restoring uniquely American native habitats and protecting our endangered species, botany plays a central role in addressing some of our country’s biggest challenges,” **said Rep. Quigley**. “One of our nation’s greatest assets is its biodiversity, which is why we must support the health of these ecosystems, as well as the dedicated scientists that have made our earth’s preservation their life’s work. I am pleased that this bill will support their mission to sustain native and locally adapted plants so that America remains a vibrant, inspiring, and sustainable place to call home.”

“From the Silver Palmetto to the Beach Sunflower, South Florida is home to a diverse group of native plants, many that are unique to our tropical climate and growing conditions,” **said Rep. Ileana Ros-Lehtinen (R-FL), who co-introduced the bill**. “Introducing this bill with my colleague, Mike, is a positive step in ensuring the preservation, conservation, and restoration of the native species



that characterize our communities and nation. We have a responsibility to help maintain a healthy and sound ecosystem that we can all be proud of. I’m glad that this bill will also encourage young people to enter careers in botanical science.”

In the United States, botanical experts help to study, effectively manage, and guide the sustainable use of the nation’s vast plant resources. However, the country is projected to lose nearly half of its botanical expertise in the next decade as experienced scientists retire and are not replaced, leading to myriad direct and indirect costs both in dollars and in the loss of critical cultural native landscapes. Both the Bureau of Land Management, which employs just over one botanist per four million acres managed, and the U.S. Geological Survey have already reported a deficiency in botanical capacity. At the same time, advanced degrees in botany have decreased by 41% in the last decade.

The *Botanical Sciences and Native Plant Materials Research, Restoration and Promotion Act* aims to increase the botanical science capacity of the federal

government. It allows federal agencies to act with the expertise required to preserve unique American landscapes and emphasizes the importance of protecting native plants and plant ecosystems. Additionally, the bill:

- Creates a new program of botanical science research within the Department of the Interior to help increase federal botanic expertise and allows DOI to hire new, additional personnel,
- Creates a student loan repayment program for botanical scientists to encourage more students to make the decision to enter the field and to support them once they’ve graduated,
- Declares a federal policy that the Departments of Interior, Agriculture, and Defense preference the use of locally-adapted native plant materials in their land management activities,
- Requires states to utilize native plant species where possible and practical, and
- Establishes a new program to support collaborative grants to prevent rare plant species from becoming endangered and to remediate already endangered populations.



## Cross Pollination—Ethnobotanists in the Field

Send me your field experiences to share with members: maybe you can pollinate some new projects! Newsletter@Econbot.org

### *Adansonia digitata* Absent from the North and West of Uganda

Submitted by Cory W. Whitney  
whitney.cory@gmail.com

This is the second edition of the story of hunting for the Baobab (*Adansonia digitata*) in Uganda.

The literature has so far suggested that the species is absent in Uganda, both from the wild and cultivated lands. Last year, we travelled through and found a number of specimens planted in the country and published a first record in *Genetic Resources and Crop Evolution*.<sup>1</sup> This year we went back and travelled many thousands of kilometers through the northern and western regions, along the West Nile and borderlands with Sudan and the Congo.

During our travels along the dusty roads of the northwest we found no Baobab. We found instead a dryland forest with many friendly communities of indigenous Ugandan farmers and hunter-gatherers (mostly Central Sudanic speaking Lugbara, Madi, and Kakwa peoples). We also found many refugees, refugee camps and roads filled with trucks from the United Nations High Commissioner for Refugees (UNHCR).

South Sudan is the world's newest nation. After decades of civil war they have formed their own country, but then proceeded to flight over resources and now live under a divided government and army. Having lived their whole lives at war, many people have no other skills. Recently the Murle and Lou Nuer indigenous peoples have started fighting. Erupting violence from cattle raids and retaliations have caused many to flee. Consequently masses of Sudanese travel south to try to escape to northwestern Uganda, and other countries. Ninety percent of the refugees are women and children.

The countryside is scattered with massive refugee camps. Sadly, the conditions were very poor with food shortages and water-borne diseases, there were several outbreaks in the refugee camps while we travelled through of cholera and other diseases. News travelled quickly through the markets and town centers, both of the illness in the camps and of the strange car full of researchers travelling through looking for the Baobab. Our little car and all the UNHCR trucks kicked up a lot of dust. Similarly to our last explorations the locals often convincingly suggested that the Baobab was grow-

ing on their land but instead, often after a long ride and hike into the bush, we found Sausage tree (*Kigelia africana*), Kapok (*Ceiba pentandra*), and even once a *Jatropha* (presumably because the inside the nut is similar to the hair on the small Baobab fruit we carried as a sample).

Our original hypothesis was that the interactions with the Sudanese and the potentially suitable growing conditions of the northwest were good conditions for the Baobab and we would find it there. Our discovery was rather that despite the many Sudanese refugees in the north none have brought the Baobab with them. The conditions are not of peaceful immigration, where people might bring seeds and plant a garden, but rather a people fleeing the horror of war, running for their lives, and escaping with nothing.

We looked very hard and can somewhat confidently conclude that these dry northern areas,

rich in Kapok and other dryland trees that often share eco-systems with Baobabs in neighboring countries, do not yet harbor the species. This is surprising since it would have been much more at home in the northwest than in the relatively humid south where we found it during our last journey.

It is our sincere hope that in the future South Sudan will have peace. If the rural indigenous Sudanese and Ugandan people of the borderlands have the chance for a peaceful interaction we feel it will allow for the exchange of planting materials along with horticultural and traditional food and other practices for the propagation and extension of the range of this wonderful tree and the many associated cultural traditions.

<sup>1</sup>Gebauer, J., Whitney, C. W. & Tabuti, J. R. S. First record of baobab (*Adansonia digitata* L.) in Uganda. *Genetic Resources and Crop Evolution* 63, 755-762 (2016)



Shea butter (*Vitellaria paradoxa*) producer in a small village in West Nile, Uganda. Photo by Cory W. Whitney



## **Economic Botany Business Office**

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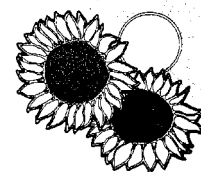
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### **New Program in Medicinal Chemistry**



Northern Michigan University is offering a new program in Medicinal Chemistry in the Fall 2017. Increasing legitimacy and legality of medicinal plants nationwide has created great demand for qualified technical personnel and great opportunity for the skilled entrepreneur in the cannabis, herbal extract, and natural product industries. Medicinal Plant Chemistry at Northern Michigan University is the only four-year undergraduate degree program of its kind designed to prepare students for success in the emerging industries relating to medicinal plant production, analysis, and distribution.

The required coursework provides a foundation in chemistry and plant biology, with a capstone research experience involving experimental horticulture and instrumental analysis of natural products, while focus tracks allow students to explore their interests in the relevant areas of business and accounting (Entrepreneurial Track) or advanced topics in chemistry and biology (Bio-analytical Track).

For more information, contact Dr. Mark Paulsen, Department Head, chemistry department.

<http://www.nmu.edu/chemistry/medicinal-plant-chemistry>