

USEFUL INFORMATION FOR STUDENT ECONOMIC BOTANISTS

Table of Contents

1.	CATALOGUES	2
2.	SOLAR-POWER SYSTEMS.....	2
3.	BINOCULARS	2
5.	DIGITAL CAMERAS	3
6.	SLR CAMERAS.....	3
7.	WATER BOTTLES.....	3
8.	TREE-CUTTING EQUIPMENT	3
9.	COMPASSES	4
10.	INSECTS.....	4
11.	FIELD NOTES	4
12.	FOOTWEAR	5
13.	GPS DEVICES.....	5
14.	HAMMOCKS, SHELTERS & TENTS.....	5
15.	FLASHLIGHTS AND ILLUMINATION	6
16.	KNIVES	6
17.	MARKERS	6
18.	MAGNIFIERS.....	6
19.	DAY PACKS AND PORTABLE PLANT PRESSES	7
20.	POLE PRUNERS.....	7
21.	PRUNERS.....	7
22.	PICKLING	7
23.	RECORDING	8
24.	PRINTING DIGITAL PHOTOS	8
25.	NOTE TAKING TO DIGITAL	8
26.	FIRST AID.....	8
27.	MISCELLANEOUS.....	11

1. CATALOGUES

- Real Goods (www.realgoods.com)
- REI Outlet (www.REIoutlet.com)
- Camp-Mor (www.campmor.com; 1-800-226-7667)
- Forestry Suppliers (www.forestry-suppliers.com; 1-800-647-5368)
- Cabela's (www.cabelas.com; 1-800-237-4444)
- Cases For Less (www.cases4less.com)
- Forestry Suppliers (was Ben Meadows) (<https://www.forestry-suppliers.com/BM/index1.php>)
- Au Vieux-Campeur (French shop, available online at www.auvieuxcampeur.fr ; +33(0)153-10-48-48. Most stores are Rue des Ecoles in Paris, 5th arrondissement).

2. SOLAR-POWER SYSTEMS

- Flexible photovoltaics are easier to transport (you can roll them up!) but are less durable.
- You'll also need to buy a battery and inverter (at least).
- The folks at Real Goods (see above) have information on their web site and also make helpful suggestions, especially in calculating the photovoltaic size necessary to power your equipment.
- One recommendation for MorningStar SunSaver-6 solar charge controller 12 V battery and AA car battery charger from Radio Shack.
- One recommendation for Double-Size Multipower Source (from Real Goods), has a handy, flexible-necked lamp that attaches.

3. BINOCULARS

- There is something of a trade-off between size and quality of image, although some of the better compact binocs sacrifice very little. One recommendation for a 1:4 ratio between magnification/power and exit pupil (the two numbers provided for all binocs).
- Lenses will mold with high humidity use if not cared for.
- One recommendation for Nikon 8 x 30 armor-plated binoculars; not compact but durable.
- One recommendation for 8 x 22 Leitz Trinovid binoculars; compact, good light, and durable.
- One recommendation for 10x25 Bushnell FOV 325 FT binoculars; compact, good light.

4. HUMIDITY & WET CONDITIONS

- Zip-Loc type bags. Be sure to use at least 2 bags!
- Lexan plastic boxes are airtight and extremely durable; great for storing first aid supplies, batteries, anything that can't get wet. GSI, Pelican boxes, and Otter boxes are three brands.
- Pelican makes a shock-resistant, waterproof box for computers.
- Tupperware can also be a good cheap alternative for waterproof boxes.
- For European fellows: Dectahlon, Aigle and other sailing accessories brands offer waterproof elements (bags, cases...), Decathlon being the cheapest with reasonably good quality.
- LIFEPROOF (www.lifeproof.com). iPhone, iPad, and Samsung Galaxy waterproof cases.

- Ortlieb (www.ortliebusa.com) makes waterproof bags, backpacks, and panniers.
- Dry bags (vinyl bags you roll up and clip) are reliable but can be heavy and can heat up.
- Dry bags with a waist strap are very handy for cameras, GPS, etc. and can be found at most outdoor and water sports stores.
- Indicator silica gel is more expensive than non-indicator but more certain; it can be heated (re-dried) a number of times (www.desiccare.com; www.desiccantcity.com). Cases For Less also sells small metal-enclosed packets of silica gel. Note: all silica gel is considered hazardous waste, however cobalt from indicating silica gel may leach into runoff or groundwater.
- In a pinch, you can use rice as a moisture absorber, replacing it frequently.

5. DIGITAL CAMERAS

- Check megapixel size for the resolution you want.
- Check storage medium.
- Most digital cameras cannot use additional lenses. Yet lenses may be quite useful, for example for light measurements using a hemispheric (or fish-eye) lens.
- The Nikon 800 series now runs about \$500; the Cool Pix 880 has a good macro function and is very compact. Keep in mind that there will be additional costs: memory chips, the USB cable for downloading to your computer (not always provided), battery recharger and rechargeable batteries, lens attachments, case, etc.
- The Nikon 900 series starts around \$700; the advantage of these is that some models can actually screw on to a microscope objective; you need to check this feature for the 'scope you use before buying.

6. SLR CAMERAS

- Bring extra batteries and several SD cards and card readers/cables!
- Highly electronic cameras are more likely to short-circuit in high humidity.
- One recommendation for Pentax K-1000; relatively lightweight.
- One recommendation for Konica T3.

7. WATER BOTTLES

- A number of participants use Nalgene plastic jars. The softer plastic is less brittle but tastes more like plastic and absorbs any flavors added, while the harder plastic has no plastic taste but is more brittle. Many water pumps screw into these water bottles.
- Klean Kanteen (www.kleankanteen.com/). High quality, stainless steel water bottles in a variety of sizes.
- One recommendation for a Reliance plastic canteen with a canvas cover to help keep liquids cool (if the canvas is moistened).
- One recommendation for a French enameled canteen with a clip top; it is indestructible and absolutely leak-proof.

8. TREE-CUTTING EQUIPMENT

- 50m of 10 mm climbing rope with single rope technique using a Petzl ascender and Croll, Petzl descender, Safety rope, Petzl harness, throw bag and line, Big Shot sling shot (for putting up ropes) all from Sherill (www.wtsherill.com).

- Alpine equipment is essential for ecological studies, but for collecting, two kinds of spikes were recommended; the French griffes are less versatile but more secure; the telephone pole spikes are versatile but do not grip quite as well. The French griffes made by Lacoste et Fils are iron arcs, strapped to the feet, that have spikes on the inside of the arcs. Two sizes are used, one for trees up to 20 cm diameter, the other for up to 50 cm. They are heavy, but easy to learn to use and secure on the tree. They are not useful for larger trees or trees with awkwardly shaped boles. They have to be ordered from France. Strong boots are essential for using these spikes. The telephone pole spikes (available from Forestry Suppliers & elsewhere) consist of two steel shanks with a spike on the instep, strapped to the ankle and foot. They are versatile, somewhat more difficult to learn to use, more compact and lighter, but tougher on the ankles.
- Safety belts are of course essential. Relatively heavy-duty nylon web material with two D-rings are recommended; One recommendation for the type with a rear strap for butt support, which avoids wear on the kidneys from prolonged leaning and they are not appreciably heavier. Recommends for using two lanyards for security when getting around boughs.

9. COMPASSES

- You have to be careful with declination (for an extra \$10, Suunto will adjust the compass for the part of the world where you are working).
- A sighting compass is good for making a line, one recommendation for a Silva Ranger or a Suunto sighting compass.

10. INSECTS

- DEET dissolves plastics (like eyeglass lenses) and is reputed to be a health hazard. Some have used it successfully as a tick repellent, while others recommended using any sulfur-based material (like merthiolate) for that purpose.
- Reported varying degrees of success with a number of more home-style repellents, including citrus peel, Skin So Soft (now sold at camping stores), Protium fruits or Tagetes leaves rubbed on the skin, Vick's Vapo-Rub, smoke, etc.
- One non-DEET product in Green Ban (with mixed reviews).
- Head nets are not very comfortable but very useful under extreme conditions such as plagues of sweat-bees, which can be dangerously distracting when you are up in a tree. A head net without a frame costs \$5, fits in your back pocket, and goes over your baseball cap or other hat.
- Portable mosquito netting. REI (www.REI.com) offers a wide variety of insect net clothing and shelters.
- Note: Several reported that blue clothing tends to attract stinging Hymenoptera.
- For mosquito-infested areas: incense, citronella essential oil or basic spray insect repellent, mosquito net. Prefer light-coloured clothes (white/beige) and avoid blue. Long sleeved shirts and long pants. You can soak them with insect repellent before going on your trip (Insect ecran, special for tropical areas, available in France and probably elsewhere!), or spray them. Andiroba oil (*Carapa* sp) is also recommended in Brazil to be used as mosquito repellent.

11. FIELD NOTES

- Many participants use the Rite in the Rain field books (although one suggested that

people tend to take careless notes in the rain and would be better off recording nothing then).

- Rite in the Rain also make copy paper so you can laser print or photocopy waterproof data sheets.
- One person records field observations on a microcassette recorder and transcribes them at night into a hardbound field book.
- One person urged everyone to make a photocopy of their field books as soon as they are back in civilization; leaving a copy is actually required in Brazil and other places.
- An aluminum sheet holder (from Forestry Suppliers) is useful for writing on in the field and storing pages when rain begins to fall.
- Writing with pencils avoids having problems of ink spreading across the page.

12. FOOTWEAR

- Some swear by rubber boots (although someone pointed out that you should not wear rubber boots in a boat).
- Some are using army surplus 'jungle boots', which have drain holes, are light, and dry quickly.
- One recommendation for Palladium 'jungle boots.' These have gotten trendier in recent years, but they still make basic boots that are fairly inexpensive, lightweight, and fast-drying for work in the tropics. Available at www.palladiumboots.com.
- Leather boots are comfortable, but on extended trips you have to maintain the leather to keep it from separating from the sole.
- Surf or kayak boots are super interesting in river areas, including the Amazon rainforest, if studying igapos/mangroves in the rainforest or near shores.

13. GPS DEVICES

- Several participants said that the external antenna makes a big difference in forest understory (you can climb a tree, too).
- Be sure to get a model that can take an interface cable for a computer.
- Check if model makes lines and polygons in addition to points (if you so desire).
- Some may wish a model that has a data dictionary (allowing you to input data when taking a reading).
- New models allow wireless connection to a tablet PC; one can have an image uploaded onto the tablet PC and do real time ground-truthing.
- Many favored Garmin.
- One has heard that the new eTrek series is accurate, small, and easy to use.

14. HAMMOCKS, SHELTERS & TENTS

- One participant recommended the garimpeiro (miner's) hammock available in Brazil; they are very lightweight and durable.
- Mosquito net is highly recommended in the Guianas and many parts of Brazil, and hammock mandatory. Useful and safe (if not as comfortable): Premium Voyage hammocks with integrated mosquito net: sawn on one side and zipped on the other. For longer stays you might prefer a good wide hand-woven hammock with a separate mosquito net.

- For those who don't like hammocks, there was a recommendation for a travel tent (one person and two person from www.LongRoad.com)
- In warm and humid areas, have a light blanket or light sleeping bag, even and above all if sleeping in a hammock. Dawn makes everything damp and makes you cold.

15. FLASHLIGHTS AND ILLUMINATION

- Small, waterproof Mag-Lite flashlights, come in a number of sizes. Be sure to take along extra halogen bulbs. Do not buy black, which is easy to lose in the dark!
- Eveready makes a \$10 combo lantern-flashlight that is pretty versatile and reasonably economical with bulbs. It is not waterproof. It helps solve one sticky problem, which is area lighting, especially when you are pressing plants at night.
- Hand-powered magneto flashlights (sold in the Fischer catalog) and dynamo flashlights (see Real Goods) are surprisingly useful. No batteries needed but they do have a magnet, so keep away from your computer!
- Collapsible candle lanterns can be useful, although the glass can still break if they are abused in the closed position, but they also can easily fall over and become a fire hazard. Regular candles are a must as backup and for area lighting.
- Headlamps are very handy on trails and of course free up the hands; most models tend to consume a lot of batteries so be sure to bring extra! You can buy a cheap Velcro nylon head strap that will convert a Mini Mag-Lite into a headlamp. PETZL headlamps are also an excellent option.
- New LED flashlights may be a good option, but haven't heard from anyone who has used these in high humidity.
- Candles are seriously helpful in small shelters, providing light and acting as mosquito repellent.

16. KNIVES

- Leatherman-type multi-tools are very popular in the group. On some models the handles of the pliers can be tough on the hands.
- Gerber and perhaps other companies make knife sets that consist of a handle and several types of blades for more serious knife-work.
- Simple sharp blades for European citizens: Opinel.

17. MARKERS

- Sharpies are economical, but they dry out quickly if left uncapped.
- One recommendation for Ideal-Mark pens, sold by Forestry Suppliers. They are relatively expensive but go a long way, and the valve action makes it so that they are not left worthless if uncapped for a time.
- In a pinch, a pencil or China marker will work too.

18. MAGNIFIERS

- One recommendation for a 10x Bausch & Lomb illuminating magnifier that takes two AA batteries. Good for poorly lit forest understories.
- For herbarium work, there is an illumination magnifier used by philatelists that is about the size of a flashlight and has a millimeter scale on it; it takes two C batteries.

19. DAY PACKS AND PORTABLE PLANT PRESSES

- One recommendation for day packs that have a top compartment; this gives quick access to small items and protects better from the rain.
- One recommendation for the "Orion Trekker" by LowePro. The base is a padded camera case large enough for a camera, a couple of lenses, and a flash, or possibly 2 cameras with lenses and a flash, if the camera bodies are small enough. The upper portion is a small backpack with a couple of zipper compartments. The straps and back padding are excellent; it also has a waist belt.
- One recommendation for the Mountainsmith Day Pack (either lumbar or shoulder).
- One recommendation for external frame packs because they have more options. The pack can be removed and a crate or other equipment can be tied to the frame; further, two external frames can be put together and used to carry an injured person.
- One recommendation for Ortlieb waterproof pack, because you don't have to worry about a surprise storm or canoe-tipping!
- Herbarium Supply (www.herbariumsupply.com) sells portable plant presses that are extremely convenient for collections in the field and while hiking.

20. POLE PRUNERS

- One recommendation for Missouri-style aluminum poles made to order; they have an internal pin on a spring. They are light but rather flexible and can buckle with heavy use.
- A couple recommendations for Jameson fiberglass poles available from Forestry Suppliers. These have an external pin; they are heavier than the aluminum ones but more rigid and perhaps more durable.
- For cord, one recommendation for using tubular webbing rope available from camping stores; otherwise, braided nylon rope can be found. It is important that the rope not have too much elasticity.

21. PRUNERS

- One recommendation for the Snap-Cut; they are durable and inexpensive.
- One recommendation for the Felco No. 2, which is expensive but self-sharpening, strong, and extremely durable. The Felco No. 5 is less expensive and has great power but is not self-sharpening.
- One recommendation for the Florian ratchet pruners (and pole pruners).

22. PICKLING

- Whirl-Pak bags are extremely compact and collapsible, but they can leak. Maybe best to put a number of them into a Tupperware container.
- One recommendation for centrifuge tubes for modest-sized pickles; they are leak-proof and durable.
- Nalgene jars come in all sizes, but they become brittle with time, especially when they contain alcohol or FAA.
- Bundles of newspaper-pressed herbarium specimens that cannot be field-dried should be saturated with 50-70% alcohol and kept out of the sun in airtight, strong, clear plastic bags. One person found that large and/or fleshy fruits must be preserved in 90% alcohol to avoid mold, and the larger fruits must be cut in half.

23. RECORDING

- Check to see if records in stereo.
- Be sure to have an external microphone.
- For digital recorders, check storage medium (a couple of years ago only Memory Sticks were used).
- One recommendation for Archos Multimedia Jukebox for recording interviews direct to MP3 (as well as storing excess digital photos); has a Compact Flash adapter.
- One recommendation for a Zoom H1 Handy recorder of very good quality for interviews and sounds (birds, music) recordings. It has two external microphones. Make sure to buy a foam protection for the microphones, and store in a waterproof case.

24. PRINTING DIGITAL PHOTOS

- Inkjet-printed digital photos fade rapidly in high humidity. But, it is easy to purchase glossy inkjet or laser printer photo paper, format photos, and print glossy inkjet or laser printer photo paper, format photos, and print them.
- A number of on-line places allow you to upload photos and they will send you prints (several people recommended www.otophoto.com).
- Most drugstores also have photo kiosks for printing digital photos.

25. NOTE TAKING TO DIGITAL

- Handspring Visor Prism with portable keyboard for transcribing interviews on the fly.
- Tablet PCs (including new 'rugged', 'waterproof' version).

26. FIRST AID

- Be sure to see a travel clinic before traveling! A number of items are recommended for medical kits, but consult with a healthcare professional. This list is meant to be helpful from previous experience in the field and does not claim to be a replacement for medical advice or to reflect the views of the Society for Economic Botany as a whole.

Item	Use
<i>Ace bandage</i>	For sprains; also for light binding above the site of snakebites.
<i>Alcohol wipes</i>	Many uses
<i>Allergy Cream</i>	Benadryl, Fenegan, Caladryl, Quadriderm, Cortaid, etc.
<i>Analgesic pills</i>	Aspirin, Tylenol, Ibuprofin, Advil, etc. (Advil is quite stronger than simple aspirin, for heavy

	bruises and sprains). Europe: paracetamol.
<i>Antibiotics</i>	For serious infections, bacterial dysentery.
<i>Anti-diarrhea pills</i>	Imosec, Imodium paregoric, Normal Stool Formula, etc.
<i>Anti-malarials</i>	Be aware that there have been many reports that Lariam has neurological and psychiatric side effects. Europe: Malarone (expensive but well tolerated for trips <3 months). Doxycycline/Doxyalu for trips > 3 months, but makes you photosensitive: wear sunscreen and hat at all times. There are some arguments that as you are prescribed the same medication if you contract malaria that anti-malarials are unwarranted. Do your own research and make the decision for yourself. We do not take responsibility for your decision or health!
<i>Anti-pyretic</i>	
<i>Antiseptic cream</i>	
<i>Antivenim</i>	To counter snakebite.
<i>Bag Balm</i>	Effective for extremely dry skin.
<i>Band-Aids</i>	Various sizes; colorful ones good if you will be around kids!
<i>Butterfly bandages</i>	For more serious cuts.
<i>Burn cream</i>	
<i>Clove oil</i>	For toothache; consider a temporary filling kit.
<i>Emergency blanket</i>	You can get hypothermia even in the tropics!
<i>Epi-Pen® or Ana Kit®</i>	By prescription to counter anaphylactic shock caused by allergic reaction.

<i>Eye drops</i>	
<i>Foot fungus treatments</i>	Creams (Omcilon, Foldan, etc.) or powders (Desenex, Metaxa, etc.).
<i>Forceps</i>	Fine point, for sutures, removing splinters, etc.
<i>Gatorade</i>	Same as rehydration salts, but tastier!
<i>Gauze</i>	
<i>Grapefruit Seed Extract</i>	GSE Liquid Extract from Nutribiotic. Take daily in water to help prevent stomach issues while in the field (www.iherb.com).
<i>Iodine</i>	Brings splinters to the skin surface.
<i>Krazy Glue®</i>	Or equivalent; useful for many purposes, including sealing the skin on a serious wound.
<i>Metronidazol</i>	For various types of intestinal worms.
<i>Merthiolate</i>	Or other topical antiseptic.
<i>Metronidazol</i>	Also called Flagyl. For amoebas, giardia.
<i>Razor blades, single edge</i>	For lancing, etc.
<i>Rehydration salts</i>	Particularly important if you are anywhere near cholera, but also useful under any dehydrating circumstances.
<i>Rope</i>	80m (surprisingly compact!) heavy-duty rope for crossing flooded rivers.
<i>Rubber gloves</i>	For sterile work (non-latex preferred b/c many allergic).
<i>SAM splint</i>	Convenient, flexible, compact splinting material.
<i>Steripen</i>	UV water purification. Great and easy to use, but be sure to bring back-up batteries and bulbs (www.REI.com).

<i>Stomachache remedy</i>	Andrews salts, Tums, etc. For Europeans: Spasfon.
<i>Suture kit</i>	Available at larger drug stores.
<i>Swabs</i>	
<i>Syringes</i>	Even if you don't intend to use them yourself, at least you will have sterile ones if anyone needs one.

Note: In France, some medications like anti-malaria or antibiotics are only delivered on medical recommendation ('ordonnance'). For those elements, bring a copy of the document provided by the doctor AND the recommendations of use. Customs sometimes ask for them.

27. MISCELLANEOUS

- Elastic bands
- Tape
- Rope to use as a clothesline or for other purposes.
- Sunscreen, 50/60 and waterproof. Aloe Gator gel sunscreen is great when you are sweating and/or in the water and will last the whole day without reapplication.
- Sunglasses (in Europe, make sure you have the UE label. Favor categories 2 and 3).
- Sunhat (better than a baseball cap).
- Soap. Dr. Bronner's is a great natural option and can serve as body soap, dish soap, toothpaste, and shampoo, among other purposes.
- Baby wipes or handkerchief.
- Trash bags to secure your stuff in the rain.
- Sewing kit to fix holes in hammocks, mosquito nets.
- Synthetic towels (Europe: 'serviette polaire', Decathlon).
- A stash of nuts or energy bars can be useful to have as a backup food supply.