HOW TO SCAN FRESH PLANTS, *a la* Sue Rutman
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If you enjoy these scanned images of plants, you might want to scan some, too. Here's how I do it. You will likely develop new methods to suit your own needs. Give it a try!

The following instructions will help you pick the right type of scanner and collect plants that will look nice when you scan them.

COLLECTING SPECIMENS

Collecting fresh plants for scanning is different than collecting them for pressing. Here's what I use:

Equipment:

- Insulated or uninsulated collecting bag (with an ice pack when its warm)
- Lots of quart-sized and gallon-sized *zip-lock* plastic bags
- Fragment bags (aka paper packets or small envelopes, to store seeds)
- Scissors or pruners to cut specimens and tongs for plants you don't want to touch
- Tool to dig up underground parts if necessary
- Pencil & paper
- A cooler with plenty of ice in your vehicle.

Collect only as much material as you need. A 6 to9–inch piece of a plant is usually enough; bigger pieces won't fit on the scanner. Collect the whole plant of small annuals, including roots. For larger annuals, collect representative pieces. Make sure you collect diagnostic pieces, such as flowers, leaves, stems, fruits, seeds, but also other structures that might be diagnostic, such as stipules. If you collect seeds, be sure to collect and scan a piece of the plant that will help you (or someone else) identify or verify the plant later. If you are vouchering the specimen, make sure your records are good enough to link the scan with the herbarium specimen.

As soon as you collect the specimen, place it in a plastic bag and seal it. Put only one species in each bag to exclude cross-contamination of hairs, seeds, etc. Place the bag in the collecting bag. After returning to your vehicle, place the plastic bags in the cooler. Scan the material as soon as possible.

Helpful hint: Don't collect a lot of specimens on each expedition or else you'll be scanning a long time when you get home. A good rule is to collect less than 30 species per day; scanning 30 specimens can take all day. If you don't scan the specimens on the day of collection or within 24 hours, you'll have to refrigerate the specimens but they won't look fresh when you scan them.

To document a species in varying phenological stages, you'll have to visit a site repeatedly. This is especially true if documenting flowers, fruits and seeds is one of your goals.

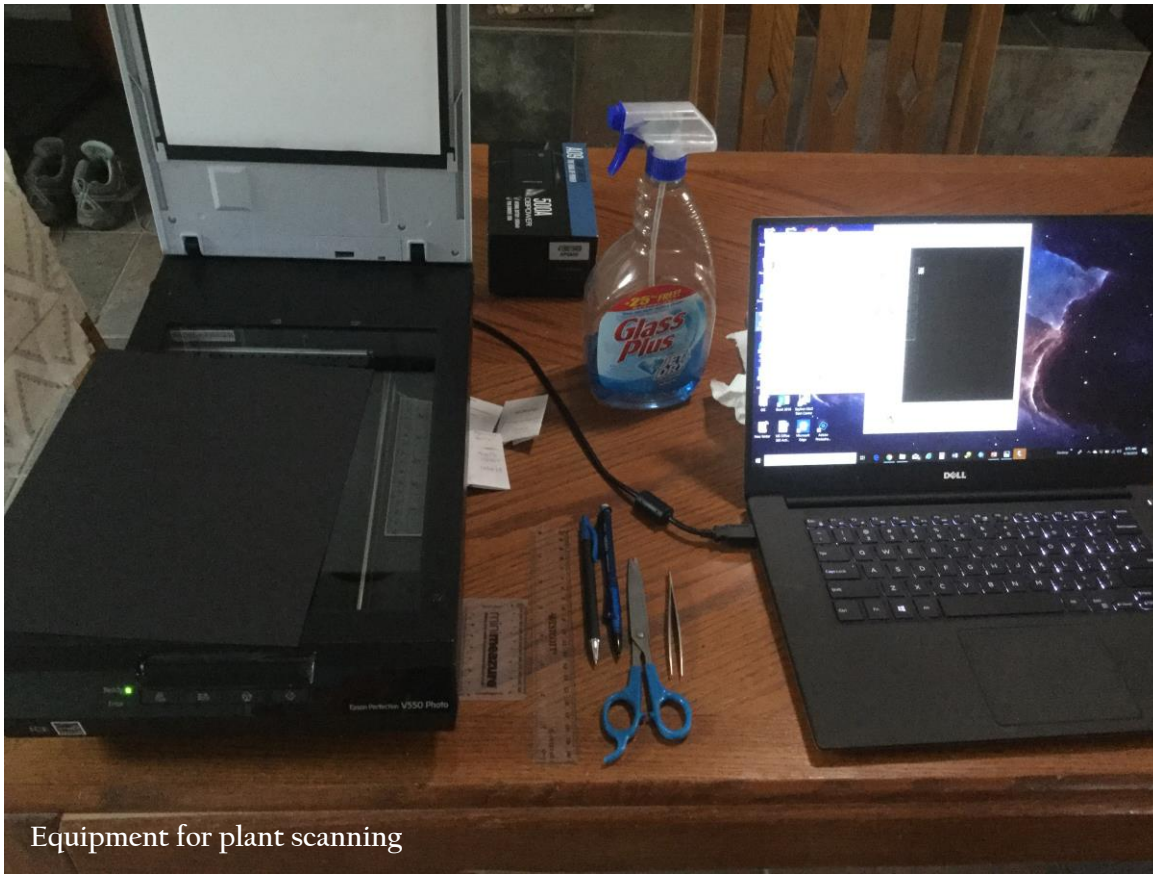
HOW TO SCAN

Equipment:

- Photo scanner with capability of scanning photos at least 2400 dpi. See notes on scanners & resolution below.
- Centimeter rule, preferably very thin, transparent, colorless

- Forceps
- Scissors and/or small, sharp knife
- Sheet(s) of black paper (card stock preferred)
- Window cleaner for cleaning the platen
- Fantastic brand household cleaner for removing resins and oils from the platen
- Paper towels
- Waste basket
- Paper and pencil (optional, if you want to make a list of what you've scanned)

There are two types of scanners: CCD and document scanners. CCD scanners are set up to do high-quality scanning of photos and slides and are best at capturing colors. I currently have an Epson Perfection V550 but any similar one will do. I like Epson because the brand offers user-friendly software and does excellent scans. Flatbed scanners (like the kind you use to scan office documents) won't do a good job because they don't have the depth of field you need.



Equipment for plant scanning

The resolution you choose depends on 1) the size of the image you'll be using; 2) the size of the original material; and 3) how much time it will take to do the scan. If you want to post the image online, then you don't need to make an image that will be unnecessarily large (in pixels and file size). Scanning a branch that is 9 inches long can be scanned at 400 dpi for most purposes. Smaller pieces can be scanned at 600 to 800 dpi. A resolution of at least 1200 dpi up to 2400 dpi should be used for small plant parts such as seeds, stipules, hairs, glands, and flowers. I find that a resolution of greater than 2400 usually does not add more detail, even to small seeds. If you're in doubt about which

resolution to choose, choose a higher resolution rather than a lower one. After all, it took you some time to collect and process the specimen, so make the best scan you can.

Take time to arrange the specimen. The plant should be shown to its best advantage. Place it on the scanner in a position that mimics its natural form (e.g. hanging flowers should hang). For visually pleasing results, the main axis of the subject should be parallel to your ruler. Plants arranged at an angle waste space. A minority of specimens (e.g. some vines and flowers) look best when horizontally aligned. The image of the plant should reflect how the plant grows in the wild but should also look good in a published format.

If you are scanning seeds, take some time to prepare them. Remove fruit fragments. It is often more visually pleasing to place seeds in some pattern, rather than a random grouping. For sub-millimeter seeds, it seems to work best to group them in a rough square 0.5 cm on each side. Scans can't pick up the details of sub-millimeter seeds but if you group them together, you can get some idea of size, color, shape, and a hint of surface detail.

After the object is arranged on the scanner, carefully place a piece of black card stock or paper on top of the object and close the lid. The black background helps to highlight seeds and small plant parts like hairs. If you prefer a white background, don't add the black paper. Cautionary note: If you don't cover the specimen with paper before lowering the scanner cover, the interior of the scanner cover will quickly get punctured and stained. Protect your cover or it can get expensive.

Look at the image immediately after the scan and before you lift the scanner lid. Does it look good? Can you see the structure(s) or feature(s) you wanted to show the viewer? Do you need to scan it at higher resolution? Is there any "trash" in the view (bugs, hairs, dirt, stains)? If it doesn't look good, the time to fix it is now.

Label your scan immediately. If you wait to label it, you might forget what it is or where and when you collected it. A suggested filename format is: ScientificName_Location_Date. In a separate file, you can keep a list of scans and more detailed information about collection locations and dates.

Be sure to keep your scanning surfaces clean. Fingerprints, dirt, resin, stains, or other extraneous things on your image can be distracting and/or ugly. Clean the platen frequently and keep the white surface on the lid clean too, especially if you are using it to scan with a white background.

Protect your platen! Fingernails, dirt, wood, thorns, and spines can scratch the platen. Scratches are permanent and will appear on all future scans in the scratched area. Scratches are distracting and can obscure details.