

Photographing Tree Disorders

When the cause of a tree disorder cannot be identified, it is not always necessary to collect and submit samples to a diagnostic lab or to have a specialist visit the site to determine the cause of the problem. Digital photographs can be taken while on-site, and submitted electronically to NCFS Forest Health staff, the NCSU Plant Disease and Insect Clinic, or other specialists for assistance. It is also a good idea to submit photos with plant, disease, or insect samples because they can provide additional information about the appearance of the tree, the site, and potential causal agents that samples alone may not provide. Like sample collection and submission, there are guidelines that should be followed when using photographs for diagnostic purposes to maximize their usefulness.

- 1) **Take many pictures.** You can never take too many pictures; often important clues may not be visible from all angles, all locations, and at all distances from the tree. A single picture is almost never enough; instead, a set of pictures should be taken that capture a range of scales including the overall site, the area immediately surrounding the tree, a view of the tree from all directions, overall symptoms, close-ups of affected areas, close-ups of groups of symptoms/signs, and even close-ups of individual symptoms/signs such as a single leaf, leaf spot, insect, or exit hole.
- 2) **Scale is very important.** Every picture should be taken with an object in the frame that provides a scale reference. When taking a picture of a tree, a nearby house or person in the frame is usually sufficient. Horizontal distances can be indicated by flags/flagging laid out at set intervals. Close up photos should always include a ruler when possible. If a measuring stick or ruler is not available, some other object can be substituted if its size is generally standard (e.g. a coin, pencil, pocket knife, etc.) Sizes and distances that may seem obvious on site may be difficult to determine in a two-dimensional image with no scale references.
- 3) **Show progress.** Photographs provide information about a single moment in time, but symptoms and signs change. If possible, take a series of pictures that captures important changes. Some symptoms change relatively quickly, so a series of pictures over the course of a few days may be useful. Other symptoms change slowly, so pictures taken over several years may be necessary to demonstrate the problem. When taking a series of photographs, it is best to take them from the same location at the same time of day. When a time series is not possible, a good substitute is to take pictures of other plants in the surrounding area that may be afflicted with the same problem, but are at different stages of symptom progression. Take pictures of plants that are healthy, lightly impacted, heavily impacted, and even dead.
- 4) **Focus please.** Blurry or grainy images are virtually useless, especially in close-ups or when looking at fine details. Move plant tissues or other items to be photographed into lighted areas when possible. Flashes are useful for providing some light, but may bleach-out important details. Use a tripod or other solid object to rest the camera on to steady shaky movements. Use the shortest shutter speed possible without allowing pictures to become too dark. Use optical zooms only; digital zooms only reduce image quality (digital zooming has the same effect as magnifying/zooming in on the computer screen, so it is unnecessary in the field). Higher image resolutions are best.
- 5) **Learn to use your camera's macro setting.** Most digital cameras today come with a macro setting that allows the camera to focus on very close objects. In standard setting, pictures taken less than a foot (sometimes more) from an object will be out of focus. Switching to the macro setting allows you to hold the camera only inches from the object you want to photograph and provides excellent details of small features. Close-up pictures taken using the macro setting need to be taken in a well lit area (without a flash), but are an excellent way to provide quality images of leaves and insects for example. If a macro setting is not available, hold the camera only as close as the object will remain in focus; if the image quality is sufficient, the photo can be examined under magnification later. Blurry images taken close up with a standard camera setting cannot be used.
- 6) **Label your pictures.** Just as with sample collection, photographs alone provide limited information. Photos should be submitted with all of the same information samples are submitted with (*see Appendix E*). In addition, each photo should be labeled with a description of the image including what you are trying to show and where the picture was taken from.
- 7) **Don't downsize.** When sending digital photographs electronically, it is often tempting to reduce picture size. This has the same effect as reducing image resolution. Send the largest file sizes possible. If many pictures need to be sent, first send a set of reduced-size images, but make the original full size images available on request.

