

## 542.4 Photographing Plant Materials

United States  
Department of Agriculture

Natural Resources  
Conservation  
Service

# Plant Materials Photography – A Basic Overview

**M**aking effective photographs of plants on location or in a controlled environment is demanding. It requires patience, planning, and an understanding of photographic processes, lighting, and composition. Always remember that you are making photographs, not just taking pictures. The difference can readily be seen and is determined by your effort and skill. The following guidelines will help provide a basic understanding of the equipment, techniques, and effort needed to help make your photography of plant materials successful.

# The Plant as Subject

Success in photographing plant materials requires time and careful study. Many plants are delicate, colorful, highly detailed, and must be observed for a period of time to determine their best and most visible attributes. Plants are individuals—each species has its own "personality." And, it's the photographer's responsibility to depict each plant in a way that portrays its best visual qualities while also providing appropriate technical information about the plant for the viewer.

Much of the photographer's time in working with plant materials involves searching. Photographs don't just happen, they're made! So the time one spends viewing a single plant or a landscape filled with a variety of plants will greatly improve the photographer's understanding.

Grasses that are slender, tall (10 inches and up) or generally found in small bunches (switchgrass, for example) may perhaps best be photographed as individuals rather than in bunches. This may help highlight details such as seed heads or leaf blades. Grasses that are used for lawns or other carpet-like purposes may best be photographed in mass.

Plants that flower or produce berries may best be photographed while in one of these stages whenever possible. The photographer has the choice of an overall view of the subject or a close up of a branch or stem in flower. Consider how the image will be used (slide show, color magazine layout) and the subject's most important features when determining the best view.

Before making any photographs look at the areas around, behind, or under plants. Dead stems, leaves or foreign material may degrade the subject and should be removed. Remember, the plant material is the subject and all other elements in the photograph will compete for attention. Some careful cleaning before you make the photograph will help eliminate distractions and greatly improve the image and interest for the viewer.

## Equipment

Ideally, the photographer should not consider cost when choosing equipment. With photographic equipment, you usually get what you pay for. However, the following list is geared to the advanced amateur and should not be a problem for most budgets.

*Cameras:* Most digital cameras or 35mm single lens reflex (SLR) cameras with interchangeable lenses on the market today are acceptable for plant materials photography. Nikon, Minolta, Canon, and Pentax are all excellent choices and offer a variety of lenses and features suitable for plant materials photography. You may wish to consider purchasing a camera whose maximum flash synchronization shutter speed is above the standard 1/60th of a second. Synchronization speeds of 1/125th and 1/250th are very useful when using a strobe to fill in shadow areas under daylight conditions. I generally do not suggest the use of fully automated cameras (auto exposure only) for plant materials photography. The photographer must have the capability to adjust exposures manually as lighting conditions change. Meters in many fully automated cameras under or over-compensate for some lighting conditions found in the practice of plant materials photography. And the photographer must be able to manually adjust exposures as each situation presents itself.

*Lenses:* A macro lens in the 50 - 60mm range that accommodates one-to-one reproduction is a must. Purchase the fastest (f2.8 or faster) macro lens available. For close-ups of flowers, small grasses, small branches with leaves/flowers/berries the macro lens is indispensable. You will find a use for other lenses in the 20 - 135mm range as well. A good basic lens outfit should consist of the 50 60mm macro, 28mm, and a lens in the 85 - 105mm range. Most lenses in focal lengths above 135mm would generally not be used in plant materials photography.

*Tripod:* Like the macro lens, a tripod is a necessary piece of equipment. I strongly recommend the Gitzo line of tripods. They are rugged, versatile, available in a wide variety of sizes, and can be purchased through most retail photographic shops.

When choosing a tripod (especially for plant materials photography) look for the following features:

- Tripod legs that will allow the photographer to obtain a firm set-up on uneven ground. This means having legs that are not braced by extensions to the center column. Legs that swing out at a variety of angles from the center are the most useful.
- A center column that will invert and allow the photographer to position the camera from below, extending toward the ground (upside down). This will help the photographer obtain angles of view that might not be possible otherwise.
- A center column that is elevated via a crank may prove useful for small adjustments in angle and position. This feature is often undesirable, but in photographing plant materials, it can be an advantage.
- Tripod legs whose leg extensions are tightened via a screw collar are preferable. Legs that are tightened via a locking lever have a tendency to slip when wet and when worn due to heavy use.

*Cable Release:* The use of a cable release is highly suggested any time the exposure involves shutter speeds below 1/60th of a second. Many beginning photographers think that a tripod alone will provide a stable platform. This is true in most cases. However, many situations will involve very slow shutter speeds and a tripod alone will not always guarantee that the image will be sharp.

## Technique and Composition

Photographic composition of plant materials may be handled using many of the basic techniques employed with other subjects. You may not wish to "frame" your subject with another plant (like using a tree in scenic photography). But the standard rule of thirds and leading lines techniques should all be used as each situation presents itself.

When making a picture of a low growing plant mass (grasses, for example) try placing the horizon line high in the frame and move in as close as possible (with a wide-angle lens). And fill the frame with as much of the subject as possible while keeping what is on the horizon line visible. This will provide the viewer with a sense of "place" while still focusing upon the plants. It is often important for the viewer to understand how a particular plant species "fits" into the environment as well as to have a close view of the plant.

The treatment of plant materials in photography can become very subjective. I subscribe to a literal depiction in most situations. Other photographers may desire a more poetic rendering with soft focus or some type of distortion. However, the treatment applied to most images used in USDA and other government publications tend toward a literal interpretation of the subject. In short, this means well composed, properly exposed, and tack sharp!

*Depth-of-field:* Many beginning photographers have a difficult time understanding depth-of-field and how to control it. Simply stated, it is the area within a photograph that is of acceptable sharpness to the viewer. It is controlled by the lens opening (f-stop), the exact point of critical focus, the focal length of the lens, and the camera's proximity to the subject. Two general guidelines will help the photographer to determine the focal length of lens and lens opening when making photographs. First, the smaller the lens opening, the

greater the depth-of-field is. Second, the longer (higher focal length) the lens, the shallower the depth-of-field is. Experience is the best teacher in gaining a full understanding of which combination of factors produce the most desirable effects.

The depth-of-field used when making a picture depends upon how much of the subject the photographer wishes to be in focus and/or whether the photographer wishes to have background or foreground objects in or out of focus.

When photographing plant materials that are large or perhaps bushy (trees and shrubs) the photographer may wish (for composition purposes) to show only a tip of a branch instead of the entire subject. In this situation a relatively shallow depth-of-field may also be desired to allow the background to go out of focus. However, the degree to which this will occur will depend upon the three factors. The depth-of-field will become a function of the camera's proximity to the subject as well as lens opening and lens focal length. In some situations even an exposure at f16 may only render a part of the branch in focus.

For overall views of plant materials, a wide-angle lens may be appropriate. The photographer will want enough depth-of-field so that the entire subject is in focus. It is also important to observe the foreground and background carefully. The angle of view may require study in order to eliminate objects that compete for attention with the subject (like telephone poles, street lamps, wires, cars, and signs).

When photographing subjects that are carpet-like (legumes, grasses, and other ground covers) the photographer may wish to present the subject as a large expanse of interlaced stems. In this case the depth-of-field should be measured and coordinated with a proper point of critical focus. Generally, the photographer will want to focus about 1/3 the distance into the picture and use a small f-stop (f-11 or f-16). This will help insure that most of the subject is in focus at the time of exposure. To calculate the depth-of-field, examine the distance indicator marks on the lens barrel. It will show the distance to which the depth of focus will extend based on the exact point of critical focus and f-stop used (refer to your camera's manual for a diagram explaining lens depth-of-field indicators).

*Lighting:* Three lighting factors should be observed when determining when to photograph plant materials on location - the angle of the sun above the horizon and its direction, the quality of the light (harsh, soft, hazy, clear, overcast, etc.), and the light's color.

The angle of the sun determines the photographer's ability to create "depth" (the third dimension) in a photograph. Low sun angles (45° or less) allow the photographer to photograph the subject with strong side highlights and shadows in most cases. Therefore, the ability to create depth is great.

To view a clear example of this factor, look at a silo, or similar large, round object under two different lighting conditions. First, examine a silo (from a distance) with strong side lighting by viewing it with the sun at a 90° angle to your position. You will see the side of the silo closest to the sun in strong highlight. The opposite side will be in shadow. The visual relationship of highlight to shadow makes the silo appear round to the viewer.

Next, change your position so that the sun is at your back. The sun will cast full light upon the silo and the silo will appear flat.

Now, apply this same principle to plant materials. Trees, shrubs, even close views of grasses all have round stems, branches or general shapes and are effected the same as a silo by light. By placing the sun at the side and at a low angle, the shapes of many plant materials will be delineated by a highlight to shadow relationship and the appearance of depth will be created.

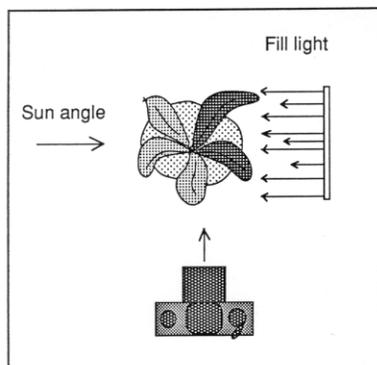
The color of light also directly affects how the plant materials will appear to the viewer. Strong low angle light in early morning or late afternoon is often very warm in color. The hours before sunset or just after sunrise are called the "Golden Hours" because they are warm and often very flattering to subjects.

Overcast days produce little or no shadows and often render a bluish cast in color photographs. Knowing how the color of light will affect the appearance of a particular subject will determine if the kind of condition and time of day chosen to make the photograph is appropriate.

The third factor to consider is timing and the light's quality. There are conditions that cause light to be soft (overcast or haze) and to be strong or harsh (clear mornings). Quality varies, so the photographer may wish to postpone a photograph if a desired effect does not exist at the time planned for making the picture. If a strong intensity is desired, this usually means shooting in the early morning or late afternoon, but varies depending upon the time of year. From April through September this means being in the field just after sunrise until about 10:00 AM and from about 3:30 PM until sunset. The period from October through March generally allows for shooting all day, as the sun is always low angle and often warm in color during this time of year.

Many of the Audubon Society, National Geographic, and general garden plant references contain photographs of high quality and will serve as excellent examples. The point is that all photographers learn from examining their own pictures and those examples around them to learn which qualities make photographs good or bad.

*Lighting Aids:* Even on the most beautiful days a subject may not be lighted appropriately. Deep shadows may exist or areas that should be well lit are not. The photographer has a number of aids available that will reflect light into areas that need extra illumination. Often a white piece of illustration board will add just the needed amount of light into shadow areas. A dull white card provides soft, even reflected light. Mirrors, aluminum foil, polished metal and other highly reflective materials provide direct and often harsh reflected light. These kinds of reflectors should be used with caution. The object is to add just enough light to provide added detail. This does not mean to flood a dark area to the point it overpowers the natural highlight areas. The photographer will need to experiment with a variety of reflectors to see what works in a given situation. Portable flash equipment can also be used to add light to subjects. I have often found this added equipment to be a burden rather than a help. And I prefer to work with the above kinds of reflectors because one can observe the reflected light much more easily. However, a small flash unit, properly adjusted, may be just the thing when reflected light is low or absent. I suggest that the photographer test the flash equipment in a variety of situations to learn how much and at what angles it will be able to provide assistance. A set of notes concerning the use of a particular flash-fill system will be valuable when in the field.



**In this illustration, light bounced from a white card will improve the shadow detail in the subject. This technique is easily done and will help improve the photography of subjects lit by strong cross or back light.**

*Environmental Problems:* Problems associated with wind, rain or poor sun angle cause difficulties for all photographers at times. The effort one takes to remedy the situation often is rewarded with a pleasing photograph. The point is that the photographer must often take some action or the photograph becomes impossible to salvage. There is no such thing as "focus fluid" to improve image sharpness despite the many wishes of many photographers. And excuses serve only to point out one's laziness or lack of imagination.

Wind may become a problem when photographing plant materials. When a close up of a branch or plant stem moves even just a bit, it can often result in a blurred picture. Fast shutter speeds may be used to counteract this problem. However, this may result in too shallow of a depth-of-field.

Two remedies are available for this problem. If the subject is not an endangered species, the photographer may move it to a wind-free location. This may mean cutting a stem or moving the whole plant (if possible). An alternative is to construct a wind shield that eliminates the problem. Often a person's jacket or small piece of cloth are effective. I often carry a piece of 4 ft. cloth and clothes pins on assignments for just such occasions. One other choice is to use the vehicle you are travelling in as a wind screen. This may not be practical in many situations, however. Do not be afraid to invent a remedy. I've used old fertilizer bags, the shirt off my back (but not my pants), and large pieces of plywood on occasion. And, do not shy away from asking your traveling companion to hold the screen.

Exposure: Exposure readings of plant subjects can be very deceiving. The beginning photographer may point the camera at the subject, expose the film according to what the camera's meter says is correct, and then wonder why the picture is too light or too dark. This could account for improperly made readings of subjects that are back lit or cross lit. The photographer must learn how to correctly make exposure readings for these situations. Back lit subjects (subjects that are photographed with the main light source behind the subject) with opaque leaves should be treated like any other back lit subject. Make the reading by excluding the bright sun from the viewfinder and filling the frame with just the subject (move in or back up accordingly).

Back lit subjects with leaves that transmit some light require experimentation, but can generally be rendered well by using the camera meter reading and bracketing at least one full stop above and below. Cross lit subjects require interpretation of just how much light is falling on the subject and from what angle the photo will be made. I suggest that the photographer begin by filling the frame with half the subject in light and the other half in shadow. Then bracket exposures at least one full stop above and below the reading provided by the camera meter.

Two aids will assist photographers with exposure readings. The first is a good quality incident meter like the Minolta IIR Incident meters read light falling upon subjects rather than reflected from the subject. Meter readings must be made from the subject at the angle from which the camera will be pointed.

An 18% gray card may also provide some assistance. This card is used to calibrate all camera meters and represents the average amount of reflected light in an average scene. It can be used to make readings in situations where the camera meter reading is in doubt. If the subject is light in value against a light background (or vice versa), the light reading may be taken off the gray card, rather than the subject. This serves little use in cross lit situations and no use for back lighting, however.

# Plant Cultivar Release Photos

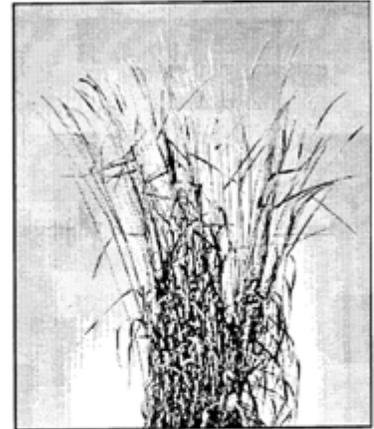
Use the following guidelines for making and submitting photographs for plant cultivar release brochures.

## *Cover:*

Compose the photo using a vertical format.

Isolate a stem, seed head, or branch that best provides plant details. Or isolate a small bunch or grouping if shooting grasses, but be sure that stems in the immediate foreground are in sharp focus, and don't cut off the seed heads.

- Shoot during the early morning or late afternoon when the wind doesn't blow the plant(s) and the light is warm and provides depth.
- Shoot from a low angle (same height as plant or lower).
- It's OK to clip and move single stems, branches, leaves, to another location for better lighting, background, or to avoid the wind (provided the plant is not an endangered one).
- Observe the background and adjust your angle if necessary to avoid distracting elements.
- The best backgrounds are out of focus and simple (blue sky or other pleasing color - black is OK),
- Insure that you use enough depth-of-field to render the subject sharply but shallow enough to provide an out of focus background.



**The best cultivar release cover photos are simple, sharp, and have plain backgrounds.**

## *Supporting Photos:*

- Rather than isolating plant details, show the plant in a natural environment.
- Shoot either horizontal or vertical format as appropriate.
- Fill the frame using good composition tech

## *Glossary*

This glossary is composed of general photography related terms. Not all of the terms directly apply to plant materials photography.

**Available Light** - The light condition that the photographer finds existing at the subject position. The term usually implies an in door or outdoor light condition of low intensity requiring fast film, large lens opening, and slow shutter speed.

**Back Light** - Illumination from a source behind the subject, as seen from the camera position, which tends to silhouette the subject.

**Blocked** - Refers to an area of the negative image so overexposed, and therefore dense, as to obscure details and texture.

**Bounce Light** - Reflected light; specifically, light directed away from the subject toward some near-by light toned surface so as to reach the subject diffused by reflection.

**Bracket** - To make a series of exposures (some greater and some less than what is considered to be "normal") in addition to the "normal" one, with the intent of getting one near-perfect exposure.

**CC Filters** - Color compensating filters, intended for use in color photography to modify the overall color balance of the image. They are available in six colors and several degrees of saturation.

**Click Stops** - Detents in the diaphragm or shutter scale of a lens which produce a tactile indication and an audible click to mark the significant scale settings.

**Contrast** - Density difference, usually of adjacent areas of the image.

**Coverage** - The area of the image (formed by a lens) which is of useful quality. Also, the area of the subject which the lens can record as an image of useful quality.

**Crop** - To trim, or sometimes to cover, the borders of an image for any reason, but usually to improve the composition.

**Cross Light** - Light striking the subject from one side.

**Daylight** - Sunlight or skylight or any mixture of the two. For the purpose of color photography, daylight is considered to have a color temperature of from about 5500 degrees K to 6000 degrees K.

**Depth-of-field** - The area of acceptably sharp focus around the subject position, extending toward the camera and away from it, from the plane of sharpest focus (critical focus point). The boundaries of the depth-of-field are referred to as the near limit and the far limit.

**Depth of Focus** - The little zone including the focal plane of the lens through which the film can be moved, toward, and away from the lens, and still record an acceptably sharp image.

**Diffusion** - Of light, the random scattering of rays as by transmission through a turbid medium or by reflection from a matte surface.

**Dispersion** - The separation of a light ray into its component colors as by a prism.

**Fast** - A term used to describe a lens of relative large aperture or a film of high light sensitivity.

**Fill Light** - Light directed into the shadow areas of a subject to improve detail lighting or reduce lighting contrast.

**Flash Synchronization** - The adjustment of the timing of the application of a firing current to a flashbulb and the actuation of the shutter release so that the peak flash intensity occurs while the shutter is open.

**Focal Length** - The distance from a lens' rear nodal point to the image plane when the lens is focused on infinity. Loosely, the "length" or "size" of a lens as expressed in millimeters.

**Frame** - (1) The adjustment of the position and angle of the camera with respect to the subject for the

purpose of composing the image within the boundaries of the viewfinder. (2) The useful area and shape of the film image.

**Gradation** - Variation in tone. Tonal range or scale.

**Gray Card** - A card of known reflectance, usually 18 percent, intended to be placed in the subject area and used as a meter target in the determination of exposure.

**Harsh** - Implies an unpleasant lack of subtlety of gradation or light distribution. Contrasty, glaring.

**Highlights** - The brightest light accents in the subject. In the negative, the areas of greatest density.

**Incident Light** - The light reaching the subject from any and all sources.

**Incident Meter** - A light meter used to measure incident light. The meter is placed at the subject position and pointed in the direction of the camera so as to measure light intensity from sources directing light upon the subject.

**Lens Hood** - A device for shading the front element of a lens from direct light outside the subject area so as to reduce flare.

**Long Lens** - The description of a lens of longer than-normal focal length.

**Luminance** - Light reflected from, or produced by, a surface.

**Macro-Lens** - A term used to describe lenses especially corrected for use at short subject distances.

**Matte** - Dull, non-glossy; referring to surface or texture.

**Opening** - Refers to lens opening and is used, loosely, to mean either lens aperture or relative aperture.

**Overexposed** - Refers to a photographic image which has received too much light.

**Plane** - Refers to the position of elements within an image in space. Actually, the term can be misleading since objects (and elements of a picture) are three-dimensional and have at least one plane that is closer to the camera than another.

**Reflection** - The rebounding of light from a surface, especially a polished surface.

**Reflector** - A surface used to bounce light. For photographic purposes, usually, cardboard, fabrics, or polished surfaces.

**Rim Light** - Back light that illuminates the edges of a subject, producing a bright outline.

**Sensitivity** - In photography, the level of a film's susceptibility to alteration by light energy.

**Shadow Area** - Any area of a photographic image that corresponds to areas of shade in the original subject. Loosely, any dark area in a positive or light area in a negative.

**Stop** - The aperture or f-number of a lens.

**Stop Down** - To reduce the size of the lens aperture.

**Washed Out** - A term to describe a pale, lifeless, gray print image, usually implying loss of highlight detail, such as might typically result from underexposure of a negative or overexposure of a positive.

**Wide-Angle** - Describes a lens whose angular coverage is substantially greater than that of a "normal" lens.

**Zoom Lens** - A very complex lens can be adjusted in focal length to provide a continuous range within its design limits.

**Suggested Reading:**

*Landscape Photography - A Kodak Guide* available from Eastman Kodak and many photo shops.

*The Art of Seeing*, a publication in the Kodak Workshop Series available from Eastman Kodak and many photo shops.

*Photographic Composition by Tom Grill & Mark Scanlon* available from AMPHOTO, New York and many photo shops.

*Art and Visual Perception-A Psychology of the Creative Eye* by Rudolf Arnheim, published by the University of California Press.

*The Nature Photographer's Complete Guide to Professional Field Techniques*, by John Shaw, published by AMPHOTO, New York.

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