



SMARTGARDEN™ —Degrees of Light

A plant's physical characteristics often offer clues to its light requirements

Why do certain plants thrive in bright, sunny locations while others wilt, scorch, or simply wither and die? How do some plants survive with no direct light? Understanding how plants have evolved with adaptations to varying light conditions and how those adaptations relate to the conditions in your garden will help you choose plants that bask in your garden's available light.

ADAPTATIONS TO SUN AND SHADE

Although most garden plants have roughly the same physical components—roots, stems, leaves, flowers—nuances in their individual morphologies equip them for a wide variety of light conditions.

Plants that grow best in shade tend to have large, flat leaves with a fairly thin epidermal layer, or skin. This allows maximum space and minimum resistance for absorbing light needed for photosynthesis and growth. In general, plants that grow in shady conditions tend to produce fewer flowers and seeds than those that grow in sun—this limited reproductive activity conserves a great deal of energy that can be directed toward vegetative growth. Thus the ornamental display of many shade gardens relies more heavily on foliage color and texture than on abundant flowers.

Plants that grow in full sun have lots of energy available for photosynthesis, but they frequently contend with high temperatures and dry conditions. Many have smaller leaves with thick cuticles, an adaptation that reduces moisture loss. Pubescence—the presence of fine hairs on leaves or stems—helps shade the plant surface from the hot sun and traps moisture lost by the leaf through transpiration, thus maintaining a higher humidity level immediately around the leaf surface.

Leaf arrangement and color also affect absorption of heat. Leaves that point upward, or are arranged vertically toward the sun—such as those of yucca and New Zealand flax—absorb less heat than those with leaves oriented at right angles to the stem. Light colors absorb less heat than dark colors, and many plants that grow in full sun where summers are hot—including several species of euphorbias and sedums—exhibit this adaptation.

A LIGHT ASSESSMENT

Light levels in a garden change with the time of day, the season, and from one year to the next. As the sun travels across the sky, a shaded morning garden may be basking in full sun by early afternoon; in summer, when deciduous trees are in full leaf, a bed that receive abundant spring sun may be densely shaded. The angle of the sun as seasons change also alters the level of light

in a garden. Furthermore, as trees mature, they cast increasingly broad shadows—beds that were originally planted in full sun may become cloaked in shade as years go by.

Assessing the light in your landscape is an ongoing project. As your garden matures, stay abreast of changing light levels and the resulting effects on your plants. To assess your garden's current level of light, examine the shade patterns several times during the course of a sunny day. Note areas that receive shade in the morning, midday, early and late afternoon.

Ideally, this examination should be conducted several times over the course of the year. But by noting the position of surrounding trees, taking into consideration whether they are deciduous or evergreen, and estimating the changing angle of the sun, you should from one day's evaluation be able to approximate the light levels in your garden for the entire year with fair accuracy.

DEFINING LIGHT LEVELS

Assessing the light levels in different parts of your garden will help you select plants appropriate to each area. Research a plant's light requirements before matching it to a site. The following explanations of frequently used terms to describe degrees of light in a garden should help you in your selection:

Full sun. Areas that receive at least six hours of direct sun during the day are considered full sun and are desirable for vegetables, fruits, roses, and a wide range of flowering plants. Some plants that thrive in full sun in cooler northern climates, however, may require some afternoon shade in warmer areas of the south.

Part shade. Some gardens receive dappled shade throughout the day. If you stand in dappled shade, you should be able to glimpse portions of the sky through the leaves above. Others gardens are more densely shaded for a part of the day but receive bright sunlight for two to six hours. Both are considered partly shaded. This level of light is well suited to a wide variety of plants.

Light shade. Gardens located beneath high branching deciduous trees may receive little or no direct sun, but are bathed in reflected light throughout the day. This condition is designated as light shade.

Full shade. Areas beneath trees with a dense canopy where no direct sunlight penetrates and reflected light is reduced, or that stand in the all-day shadow of tall buildings or evergreens are considered full shade. Careful selection of plants for such minimal light levels is necessary.

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