



## PLANT HARDINESS

## OH 54

Leonard P. Perry, Extension Professor

This is an often misunderstood topic deserving special discussion. It is not as simple as it may appear. Often oversimplified, not taking into account all the possible factors involved, the question of whether or not a plant is hardy may lead to a wrong answer and disappointment if the plant dies or does not bloom.

Hardiness is genetic. That is why some plants are hardier than others, even why some cultivars are hardier than others of the same plant. They may have been bred or selected as being hardier clones. To confuse this further, plants adapt or change genetically over time to their climate. This is why a species growing in a southern location may not be as hardy as the same species growing in a northern location. This may be a consideration when buying plants, or ordering them through the mail.

Roots, stems, leaf and flower buds usually all are hardy to different temperatures. This is why many perennials die to the ground in winter, only to have their roots survive and produce new shoots the following spring. It is also why forsythia often have leaves but no flowers. The flower buds, being less hardy than the leaf buds, are killed by cold. If flowers appear to a particular height, but not above, this represents the depth of snow cover which protected the flower buds during the killing cold.

Hardiness is a function of location in a different sense as well. A particular plant such as impatiens may be perennial in a southern or warmer climate, only to be annual if moved to a colder climate. It is hardy, but only to a certain temperature. Keep this in mind when books or articles, especially those from other countries, call a plant annual or perennial.

The most discussion though revolves around hardiness zones. These are geographic zones shown on maps which share the same range of average annual minimum winter temperatures. Few references list hardiness zones for heat, in other words, how high a temperature can a particular plant endure. Maples, lilacs, and many of our herbaceous perennials cannot take the heat of hot climates or need more cold than they get there to bloom properly.

To begin, check to see what hardiness map you are using. There are at least three in gardening publications: one from the Arnold Arboretum in Boston; one from the USDA based on data from about 1930-1960 and seen prior to 1990; and a revised USDA map seen from 1990, based on more recent data reflecting a period of cold extremes since the mid-1970s. The same numbered zone represents different temperature ranges on the USDA and Arnold maps, but they are the same on the USDA maps. Only the location of zones on the map has changed on the new USDA version. (Most areas have become colder! See OH 53 for the new version for Vermont.)

These zones as mentioned are averages, which means some years may be colder. Even though a plant may be listed as hardy in a particular zone, an unusually cold year may come along and kill it. If a plant is listed as hardy in a zone or two colder, it is likely hardy. On the other hand, a plant listed for one or two zones warmer may also grow in a site under certain conditions.

These conditions, which determine whether a plant will survive in a particular site, together are known as the microclimate. They include soil type, exposure to sun and wind, and other factors such as slope and proximity

to buildings. After the zone in which a site is located, or macroclimate, is determined these microclimate factors should be considered.

If a soil is heavy, wet, of low pH or low fertility, or in general not suited to the plant, it can cause stress which may result in winter injury. On the other hand, if the soil is too fertile, the plant may grow late into the season not hardening off properly. This, too, may result in winter injury or lack of hardiness. Amendments such as compost or peat moss can be used to improve poor soils.

Mulches can be used to moderate soil temperatures, keeping them from getting as cold and possibly injuring roots. They are especially useful on exposed sites where protective snow cover may blow off. Sites exposed to winter winds, usually from the north and west, can cause evergreens to dry out, resulting in winter injury as leaf burn. A protected site, or shielding plants with a burlap screen in an exposed one, help prevent this. Sites exposed to early morning sun in winter may result in "frost cracking" of bark of some trees, especially young ones. This results from the rapid heating of frozen bark by the sun. Tree wrap or guards help prevent this.

If a plant is near a building it may be in a warmer hardiness zone in that spot. This may be from heat loss by the building, or the sun's heat absorbed by it.

A slope is often typical of a site farther, perhaps by several hundred miles for steep slopes, in the direction in which it faces. In other words, a steep southern facing slope may be a whole hardiness zone or two warmer than adjacent level areas. This is important if a site is on a hill or in a valley. A hillside may also have airflow down it, resulting in less chance of frost.

By this point, buying a hardy plant may seem totally confusing, but it need not be. Just keep the hardiness zones and their limitations in mind when choosing a plant. Then keep the microclimate factors in mind when placing it for planting. Although this will not guarantee hardiness, as mother nature can't be predicted, it should result in minimal loss to plants from winter injury. (Also, see OH 53, Vermont Hardiness Map and OH 3, Preparing the Garden for Winter.)