

## BACK TO BASICS

### MONOCOTS AND DICOTS

by Sandy Perry

Flowering plants with seeds enclosed in an ovary or fruit are the latest and greatest evolutionary advancement in the plant kingdom. These plants are called angiosperms and have been around for about 125 million years. They dominate the higher plant flora on the earth today. Angiosperms are divided into two groups, monocots and dicots, based on plant structure.

Monocot is a shortened form of monocotyledon meaning one seed leaf. This is a reference to the single leaf that appears when monocots germinate. Monocots are the smaller of the two groups, having about 60,000 species. These include the grasses, lilies, irises, orchids, palms, aroids, sedges and many pond weeds. The structures monocots have in common include parallel veins, scattered vascular bundles, an absence of woody secondary growth and flower parts in multiples of three.

The dicots comprise some 190,000 species that include almost all the familiar non-coniferous trees and shrubs and nearly all the annual herbs excluding grasses. Dicot is also a shortened form derived from the word dicotyledon referring to the two seed leaves present after germination. Dicot veins are usually netlike, there is a single continuous vascular ring, woody secondary growth is present in trees and shrubs and flower parts occur in multiples of 4s or 5s.

Palm trees are the monocots most easily confused with woody dicots. Contrasting palms with a typical dicot such as maple will point out the differences. The roots of palms, like those of other monocots, do not thicken with age and have a limited branching capacity. Maple roots branch freely throughout the life of the tree and become

woody with age.

Palm stems may look like wood but they are not. The hard tissues are the remains of fibrous leaf stalks. The vascular bundles are scattered through the stem similar to concrete reinforcing rods. The bundles do not increase in girth therefore palm stems or trunks have little ability to expand in diameter. The mature diameter is usually established before the palm begins growing in height.

The vascular tissue of a maple tree is a continuous ring just beneath the bark. Growth of the ring on an annual basis allows for increase in stem diameter. As the interior portion of the ring ages, it hardens into wood. The continued growth of the vascular ring allows for wound closure, a system lacking in palms.

The leaves of palms are various shapes but the veins are usually parallel. Maple leaves may vary in shape also but the veins always have a netlike pattern.

Whether the palm seed has a tough husk like a coconut or a fleshy covering, only a single leaf emerges at germination. Maple seeds always produce a pair of seed leaves.

The flowering plants constitute a majority of all plants on earth and yet they can be divided into two groups, monocots and dicots, based on five simple characteristics. Sophisticated tools are seldom needed to determine the number of flower parts, leaf venation, secondary growth, number of seed leaves and arrangement of vascular tissue. These simple characteristics serve as a guidance system into the huge and diverse world of angiosperms.