Successful tree establishment begins with proper care of nursery stock during shipping and as it awaits installation at the planting site. Trees en route to the job site are often subject to desiccation. Trees shipped already in leaf will transpire large amounts of water through their leaves and are extremely susceptible to desiccation. Covering the load with light tarpaulins or shade cloth will prevent harmful drying. Even leafless trees moved in early spring or late fall benefit from protective coverings.

Proper planting or transplanting is one of the most critical steps in the life of a tree. Important factors in selecting the planting season are (1) type of nursery stock, (2) soil moisture and temperature, (3) exposure, (4) growth stage of plant, (5) plant hardiness, and (6) inherent nature of the species.

Type of Nursery Stock

In general, deciduous trees are best planted or transplanted from one site to another (1) in fall after leaf drop when the soil is moist and before the soil freezes or (2) in early spring before bud break. Early spring planting allows for root growth to occur before plants must undergo the rigors of an Iowa summer, followed by another opportunity for root growth in fall. Deciduous trees also can be successfully planted in fall because their roots are capable of growing even when soil temperatures fall to 45°F. However, a dry fall followed by extreme cold early in the dormant season can be fatal to fall transplants. Evergreen trees such as pine and spruce are best planted in early fall (mid-August through September) or later in the spring than deciduous trees. Success is greatest at this time because favorable photoperiod and warm soil conditions favor rapid root development. Planting too late in the fall season may result in poor root growth and occasionally tree death. Broad-leaved evergreens are usually planted in spring.

Bare-root Trees - Bare-root trees should be planted in early spring after frost is out of the soil and well before bud break. In the past, planting bare-root stock in late spring and summer was avoided, but with the advent of the gravel bed system (which promotes root growth), bare-root nursery stock can be safely planted during the growing season.

February, 2001

IOWA STATE UNIVERSITY
University Extension

Ames, Iowa
Balled and Burlapped Trees - B&B trees can be planted in spring from the time frost goes out of the soil into early stages of growth and twig elongation, as long as temperatures remain cool. Fall planting also is gaining favor. Successful summer planting is possible if proper care is taken. Anti-transpirants (also called anti-desiccants) are commonly sprayed on deciduous trees in leaf when they must be transported long distances in an open vehicle. By inhibiting water loss, anti-transpirants are thought to assure a greater degree of transplant success, however, anti-transpirants will not make up for careless handling or guarantee success if poor quality plant materials are used.

Containerized or Field Potted Trees - Trees dug from the field, placed in containers, and held for current year’s sales, should be treated like balled and burlapped plant materials.

Container-grown Trees - Trees grown in containers for the duration of their “nursery lives” are easy to plant and generally have the highest degree of success. Because they are simply removed from their container at planting time with a well-developed root system already in place, there is little or no “transplant shock”. Therefore, container-grown trees can be planted from early spring through fall as long as post-plant conditions remain favorable. But, transporting and planting before bud break or after leaf drop is still the most desirable time period, even for “easy-to-plant” container-grown stock.

Soil Moisture and Temperature

Trees should be planted in soils with sufficient moisture. Planting can still proceed in the absence of appropriate soil moisture provided supplemental watering is administered immediately after planting and for extended periods following installation. If watering is not possible, planting should be postponed until rains have adequately moistened the soil.

Fall planting is permissible in Iowa because it favors establishment of a root system before the onset of the following summer’s hot, dry weather. Fall planting should be carried out sufficiently early for roots to regenerate and support the plant during winter. Soils must be warm enough to permit new root growth to begin immediately after planting. Soil temperatures in the range of 60( to 70(F at the 6 to 12 inch depth are especially important for evergreen root development.

Exposure

Planting on exposed, windy sites should be delayed until spring. If fall planting must be carried out on these sites, it should be done early enough to allow new root development before soil temperatures drop to an unacceptable range. Evergreens should be shielded from prevailing winds using burlap or snow fence screens. Anti-transpirants have proven to be beneficial in some situations but are practical only for very valuable or specimen ornamental evergreens, however, some anti-transpirants have been found to be toxic to certain tree species, particularly evergreens. To lessen the chance of plant injury, always read the product label before applying these and other compounds.

Growth Stage of Plant

Most plants are more easily transplanted after terminal buds have matured. This explains why evergreens can be moved earlier in fall and later in spring than deciduous plants.

Plant Hardiness

Native plant species or those that are well adapted to Iowa will have sufficient winter hardiness. Marginally hardy species should be planted in spring and placed in sheltered areas. Microclimates that favor delayed spring growth will allow tender, young leaves and flowers of sensitive species to avoid injury from late spring frosts. If new shoot growth is killed, secondary growth must develop from axillary buds, and additional stored reserves will be depleted. In certain situations (urban settings), trees must cope with prolonged periods
of drought and drying winds. Therefore, plants also must demonstrate a degree of summer hardiness to be successful in Iowa.

Inherent Nature of the Species

The inherent nature of the plant selected for planting is extremely important. Certain plants do not reestablish readily when planted in fall or winter, but can be established successfully in spring. As an example, trees with thick, fleshy roots such as magnolia (Magnolia spp.) and tuliptree (Liriodendron tulipifera) are easiest to plant or transplant in spring. Other species that fare better when moved in spring include fir (Abies spp.), birch (Betula spp.), American hornbeam (Carpinus caroliniana), yellowwood (Cladrastis kentukea), ginkgo (Ginkgo biloba), ironwood (Ostrya virginiana), callery pear (Pyrus calleryana), oaks (Quercus spp.), bald cypress (Taxodium distichum), and hemlock (Tsuga canadensis).

Summary

Spring tree planting takes advantage of ample soil moisture (usually), and the fact that plants have an entire growing season to become established before the onset of harsh winter weather. Summer planting, after the hectic spring season, may be more convenient but soil temperatures and moisture levels may be unfavorable. Fall planting has the advantages of favorable soil temperature, adequate moisture, and time for new root growth before winter’s cold and next summer’s heat and drought. Winter planting is usually not recommended because of poor planting conditions and the potential for root exposure to lethal low temperatures.

Transplanting, or moving an established tree to another site, should be avoided during those periods of spring and summer when leaf growth is rapid. During this time tree energy reserves are low, root growth is slow, and plants are using most of their available energy reserves (stored carbohydrates) for developing top growth. Transplanting dormant plants reduces the chance for immediate moisture stress, and allows for a more equitable partitioning of reserves to developing root systems when conditions become favorable for their growth.