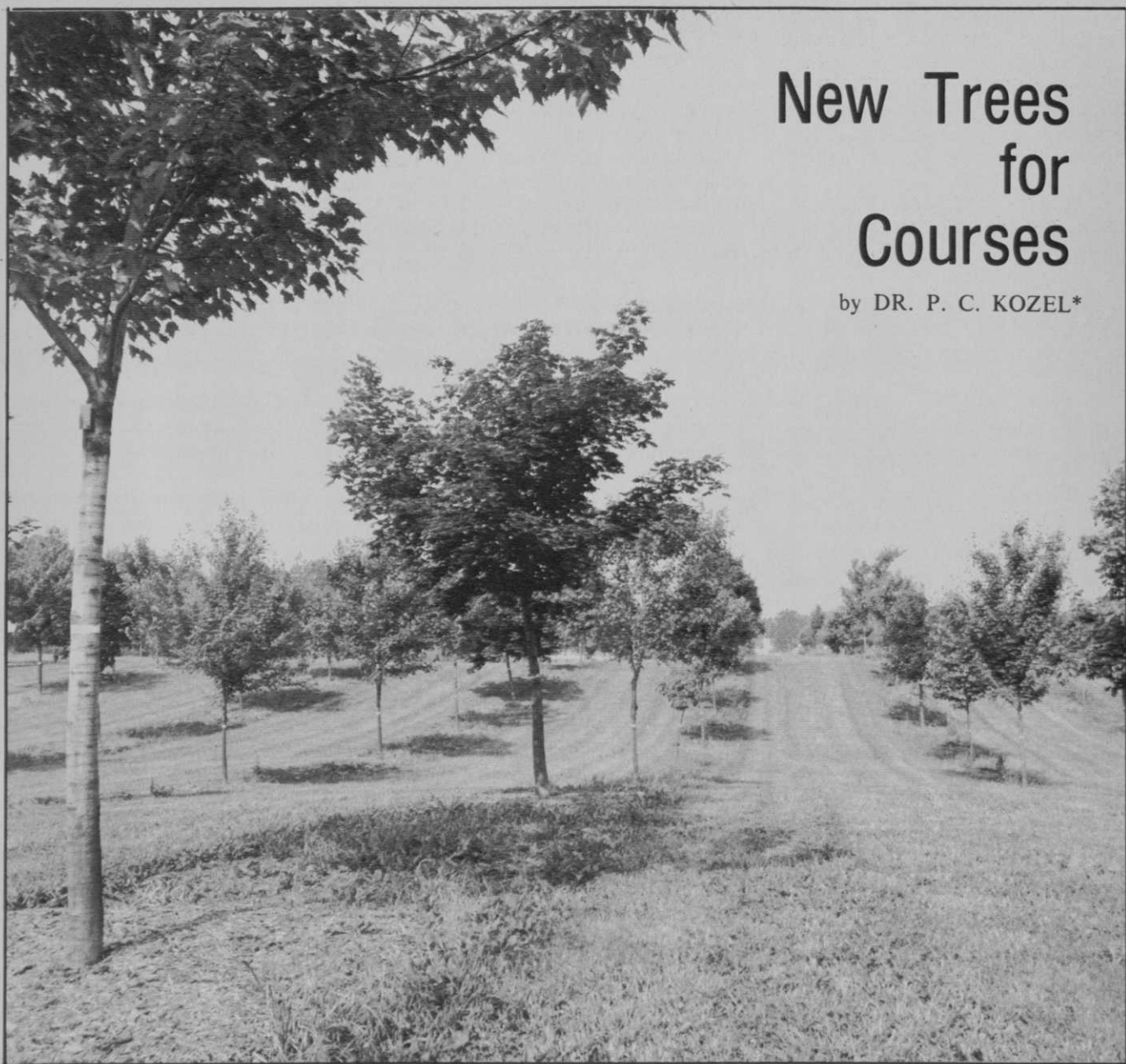


New Trees for Courses

by DR. P. C. KOZEL*



The proper tree for each location . . . this is an important emphasis area in golf course planting. Involved is the selection of trees resistant to disease and insects, as well as careful attention on appropriate form for the selected planting site, and the ultimate height and width of the tree.

In 1966, a shade tree evaluation project was started by The Ohio Agricultural Research and Development Center, under sponsorship of Ohio utility companies. The goal was to conduct a nonbiased scientific evaluation of new introductions for street tree use. Most of the selections for this purpose which are mentioned in this article can be found in the Shade Tree Evaluation Plot at the

Ohio Agricultural Research & Development Center, Wooster, Ohio. Of course, many trees in this study are well suited for golf course plantings.

The intention is not to mention all trees suitable for such plantings, but to bring attention to some shade trees which are relatively new.

Norway Maple

Acer platanoides: This plant has been used extensively in suburban and municipal plantings. The species which reaches heights of 65-75 feet is generally believed to be round headed, but is quite variable in overall shape. Trees grown from seed vary markedly in size, shape, and

resistance to leaf scorch under conditions of water stress. The following are improved introductions:

a. Cleveland — A compact, upright oval selection similar in habit to Emerald Queen. It does not grow as rapidly and is more resistant to winter bark injury as a young tree than Emerald Queen. The mature height is 50 ft.

b. Emerald Queen — This is a

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consistent, upright, oval-headed, rapid-growing selection achieving a mature height of 60 feet.

c. Greenlace — A cultivar with light green, deeply lobed foliage. It is also noted for its upright habit. The mature height is between 50 and 60 feet.

d. Jade Glen — A selection with a rapid growth rate, straight stems, and a spreading branching habit. It has a golden fall color.

e. Olmsted — A wide columnar cultivar which is not as erratic a grower in youth as some other columnar varieties.

f. Royal Red — A maroon leaf variety more resistant to heat damage than other red leaf maples.

g. Summershade — A seedling selection of *A. platanoides erectum* which is broader than Emerald Queen. It develops caliper quickly and achieves a mature height of 65 feet. It is noted for leaf scorch resistance in hot summer weather, in addition to having a strong central leader and dark green foliage.

Red Maple

Acer rubrum: The species is frequently a plant with poor yellow fall color, probably due to natural hybridization with the silver maple (*Acer saccharinum*). Trees of this species are noted for their ability to withstand moist conditions. Recently, there has been interest in selecting superior types, especially those with good red fall colors. The mature height of this species is 60 feet. Improved introductions:

a. Armstrong — A selection upright in character and the narrowest of all red maples. It is noted for its rapid growth rate, with a maximum height of 30-35 feet. This is a good choice for a narrow tree lawn.

b. Autumn Flame — A cultivar with smaller leaves than October Glory, but which colors up 2 weeks earlier and defoliates at a much earlier date. The maximum height is approximately 60 feet.

c. Gerling — This is an upright pyramidal selection, but is not as narrow as Armstrong. The maximum expected height is between 30 and 35 feet.

d. October Glory — Selected for its excellent glossy green leaves, which become a spectacular scarlet with crimson color in the fall. The foliage of this globe-headed type per-

sists longer than others. The maximum height is 50-60 feet.

e. Red Sunset — A rapid and vigorous grower, achieving a mature height of approximately 50 feet. In addition to its good red fall color, it has a natural pendulous leaf character which is less apparent in larger specimens. The foliage is persistent in the fall on this broad, upright selection.

Sugar Maple

Acer saccharum: This is a fine large tree species with generally excellent fall color which recently has been subject to decline due to pollution. The mature height is approximately 65 feet. Improved introductions:

a. Columnare — A tight columnar, slow-growing variety, achieving mature heights of only 35 feet.

b. Green Mountain — A hybrid between the black and sugar maples. It has very leathery, dark green leaves which are resistant to leaf scorch. In addition, it has good oval form with excellent vigor and good fall color, with a mature height of approximately 65 feet.

c. Temples Upright — Formerly known as Monumentale, this narrow upright selection is too slow a grower for practical street tree use.

White Ash

Fraxinus americana: This is a native species with a rapid growth rate, achieving mature heights of approximately 70 feet, and has a variable yellow to purple fall color. The selected cultivars are more desirable. Improved introductions:

a. Autumn Purple — A seedless selection with a consistent good purple fall color and a mature height of approximately 65 feet.

b. Rosehill Ash — A selection with light green foliage changing to consistent bronze-purple fall color. The mature height is 70 feet. It is a male clone, eliminating the normal seed problem.

Green Ash

Fraxinus pennsylvanica lanceolata: This a native species of rapid growth, achieving mature heights of 55-60 feet, but has the liabilities of a heavy seed crop and irregular, often weak, branches. Improved introductions:

a. Marshall Seedless — A seedless form of green ash chosen for its pyramidal oval-headed char-

acter. The dark green foliage provides a dense shade. This widely used cultivar achieves a mature height of approximately 55 feet.

b. Summit — Not as vigorous as the species but it has a straighter upright growth habit with smaller leaflets. This male clonal cultivar reaches a mature height of 60 feet. The green ash selections are good choices for street trees, as they are tough and drought-resistant and very tolerant of de-icing salts. They grow well, even in very alkaline soils.

Ginkgo

Ginkgo biloba: This species has a very uniform foliage character, excellent disease and insect resistance, and appears to be quite tolerant of various air pollutants. It has an extremely variable growth habit and objectionable fruit on female forms. The male species achieves a mature height of approximately 60 feet. Improved introductions:

a. Autumn Gold — A male selection with a mature height of 45 feet and an excellent yellow fall color, in addition to an upright, more compact habit of growth than the species.

b. Fairmount — A good pyramidal male selection, densely clothed with foliage on ascending branches, with mature heights similar to the species. Young trees have a strong, straight, tapering leader.

c. Lakeview — A male selection achieving a mature height of 50 feet. It is noted for its compact, tight habit of growth.

d. Princeton Gold — A spreading upright male selection.

e. Princeton Sentry — A narrow columnar male selection.

Thornless Honey Locust

Gleditsia tricanthos inermis: Improved introductions:

a. Imperial — A selection with a mature height of 30-35 feet which has a denser foliage than the straight inermis.

b. Majestic — A tree with a more regular compact habit than inermis. It has dark green foliage with few seeds produced. The mature height is about 65 feet.

c. Moraine — A seedless selection with good green leaves. The spreading habit becomes vase-shaped with age. The mature height is 80 feet.

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d. Shademaster — A symmetrical selection with a straight, strong trunk. It is disease-free, fairly drought-resistant, and has a mature height of 40 feet.

e. Skyline — A pyramidal form with leathery leaves and a mature height of 45 feet. The seeds are not a problem, since generally male flowers are borne.

f. Sunburst — A tree with bright yellow foliage on branch tips, along with thornless, seedless character. Mature height of 30 to 35 feet.

American Sweetgum

Liquidambar styraciflua: Young trees are generally pyramidal but become broader with age. The fall color and growth habit are quite variable on species. This tree is generally considered problem free and reaches a mature height of 55 feet. Improved introductions:

a. Burgundy — A cultivar with deep red to dark purple fall color which colors later but persists longer than other types. The mature height is 60 feet.

b. Festival — A narrow upright cultivar with light fall colors of many shades of red and yellow, achieving a mature height of 60 feet.

European Hophornbeam

Ostrya virginiana: This a suitable selection able to withstand dry city conditions. This spreading tree reaches a mature height of 50 feet and has an excellent yellow fall color.

Bloodgood London Planetree

Platanus acerifolia — *Bloodgood Strain*: This cultivar is fairly resistant to anthracnose and has a growth habit similar to the species.

Sawtooth Oak

Quercus acutissima: This is an excellent wide-spreading tree with chestnut-like foliage which is very glossy. It is usually as broad as high, which is about 45 feet at maturity.

Shingle Oak

Quercus imbricaria: Mature trees have oblong leaves, dense foliage, and broad spreading habit. A very hardy tree which needs a wide tree lawn. It grows to 75 feet at maturity.

Pin Oak

Quercus palustris: This is a commonly used species with pendulous lower branches, which limit its street tree use. Mature height is 75 feet. Improved introductions:

a. Sovereign — A selection with only horizontal or ascending branches, making it very desirable for street tree use. Mature height is 75 feet.

b. Crownright — A similar selection to Sovereign, but perhaps even narrower and more upright.

Upright English Oak

Quercus robur fastigiata: This is a columnar selection with small dark green foliage, growing to 70 feet at maturity.

Shumard Oak

Quercus shumardi: Although not a new introduction, it makes a good street tree. It has few disease and insect problems. The mature height is 75 feet.

Littleleaf Linden

Tilia cordata: This species is highly variable in growth habit if grown from seed. This irregularity of form has limited its use as a street tree. It grows to a mature height of approximately 50 feet. Improved introductions:

a. Chancellor — A selection characterized by a straight trunk, dense foliage, and a compact narrow upright growth habit. It is a symmetrical cultivar, growing to 50 feet at maturity.

b. Greenspire — A rapid growing selection with a narrow-oval form, straight trunk, and small leathery foliage, in addition to small fragrant flowers in spring. The mature height is 50 feet.

c. June Bride — A new, narrow, upright selection with very attractive yellow flowers in spring. The mature height is 50 feet.

d. Select — A special budded selection with an upright form, straight trunk, and very heavy dark green foliage. Mature heights reach 50 feet.

e. Rancho — A narrow upright selection with small foliage. This is a vigorous grower. Heights are 50 feet.

Elms

Ulmus: Improved introductions:

a. *Ulmus hollandica* Groene-

veld — A selection which has the general shape of English elm, but has good disease resistance.

b. *Ulmus parvifolia* — Chinese Elm — A very hardy small tree (to 30 feet) and a round oval form. It has dark green foliage which holds late in the fall and then becomes reddish in color. In addition, it has attractive flaking bark on older trees.

c. *Ulmus carpinifolia* Christine Buisman — A slightly irregular grower, but it is resistant to Dutch elm disease and phloem necrosis. Mature height is 60 feet.

Japanese Zelkova

Zelkova serrata: This is a species with a general vase-shaped habit similar to the American elm. It is, however, highly variable from seed which has limited its use. At maturity it will reach 60 feet. Improved introductions:

a. Parkview — A selection with the consistent vase-shape form, good foliage, and disease resistance, with heights similar to the species.

b. Village Green — A vigorous straight trunk with the desirable vase-shape form. It is a rapid growing selection, disease resistant, and very hardy. Mature heights are similar to species.

Flowering Crabapples

Malus: Unless otherwise specified, the types mentioned are resistant to apple scab and fire blight. Improved introductions:

a. American Beauty — An upright growing type with large double, red flowers. The foliage turns from a bronze to a bronzy green with maturity. The fruit is small and red and only sparsely produced. This selection is moderately susceptible to scab.

b. Coral Burst — A dwarf type growing to only 8 feet at maturity. The flowers are a double rose-pink. This tree has an upright habit with an overall oval form. It has moderate to light scab susceptibility.

c. Golden Hornet — An upright selection growing to 20 feet at maturity. This tree has white flowers with small persistent golden fruit.

d. Kilbele — A dwarf selection growing to 8 feet at maturity. This compact grower is noted for its purple red foliage and attractive red fruit.

e. Liset — A selection with pur-

ple red flowers, dark red fruits, and purple green foliage. The mature height is approximately 12 feet.

f. Mary Potter — A cultivar with pink to white flowers and small red fruits. At maturity it will reach 15 feet.

g. Red Jewel — An excellent red-fruited, white-flowered selection. The small fruits are glossy red and very persistent. The foliage is a good, glossy green. This plant has a compact habit with horizontal branching. At maturity it will reach 15 feet.

h. Red Splendor — A cultivar with foliage purple red to dark green. This plant has pink to rosepink flowers. It is moderately susceptible to fire blight.

i. Royal Ruby — A narrow upright selection which grows to 15 feet at maturity. It has large, double, cup-shaped flowers which are often 2 inches in diameter. This vigorous grower has glossy, dark green leaves with very few fruit produced. In addition, it has moderate to light scab and fire blight susceptibility.

j. Snowdrift — A single white flowering selection which is pink in bud. This selection has tiny orange red fruit which is quite persistent. It is noted for its straight trunk and upright branching habit. At maturity it will reach 20 feet.

k. White Angel — A heavy flowering single-white selection, noted for good red fruits persisting until spring. This plant flowers abundantly when young and has good glossy green foliage.

l. Winter Gold — A small, yellow fruiting selection with white flowers and good green foliage. It reaches a height of 20 feet at maturity. It has slight fire blight susceptibility.

m. Zumi Calocarpa — This cultivar has white flowers with bright red fruits persisting until spring. It has a dense upright growth habit with dark green fruit. The mature height is approximately 15 to 20 feet.

Columnar Sargent Cherry

Prunus sargentii Columnaris: This is an excellent columnar type with deep pink flowers, polished red bark, and a good red fall color. It is very hardy and maintains its narrow habit through maturity, which is approximately 40 feet.

Rancho Sargent Cherry

Prunus sargentii Rancho: This selection is similar to *Columnaris*, with the same narrow habit and sharply ascending branches.

Kwanzan Oriental Cherry

Prunus serrulata Kwanzan: This selection has double pink flowers and a compact, upright, spreading habit of growth. Very formal in character and subject to salt damage and winter frost cracks in exposed areas. At maturity, this tree will reach 25 feet.

Callery Pear

Pyrus calleryana: This species grows to approximately 30 feet and is very tolerant of city conditions and heavy soils. It has good, glossy green foliage, abundant early white flowers, and a good reddish fall color. Its thorns are a limiting factor in its use as a street tree. Improved introductions:

a. Aristocrat — A selection similar to Bradford in hardiness character, but more ovate in shape and with slightly larger leaves. In addition, the branches are at right angles to the stem.

b. Bradford — A thornless selection with all the good qualities of the species. It has a broad oval form at maturity, to 40 feet, usually fruitless, with ascending branches and a crimson fall color.

c. Chanticleer — A good, sharply pyramidal selection narrower in form than Bradford, with an excellent yellow fall color.

d. Fauriei — A dwarf selection growing to 15 feet, with a round form at maturity similar to Bradford but smaller.

e. Rancho — A cultivar with good red fall color and white flowers similar to other types.

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monly a very costly item. Good topsoil is often unavailable; and it is difficult to specify and control quality. It is rare that good topsoil does not contain weed seed. This leads to the danger of introducing serious weeds that were not present on the site. Where there is a great difference in texture between the subsoil and topsoil, this may prevent good movement of water and roots into the sub-

soil. While this may be offset quite generally by blending of the two layers, this is often not attempted or accomplished. Topsoiling a turf site before turf establishment may lead the amateur into believing the soil has enough fertility that subsequent liming or fertilization is unnecessary. Once such inertia in maintenance develops, it is difficult to overcome.

What are some considerations that may influence the decision on the use of topsoil?

Certainly, availability and cost of topsoil are very important factors. If consistently good turf is required, topsoil becomes more important. A landscape site that is below grade may require fill; and the use of topsoil, where this condition exists, adds another useful function. While it may not seem too professional, some use topsoil to cover stones and small rocks. If the topsoil layer is not too shallow, this may not be undesirable. If topsoil is used, can the objectional cleavage layer with the subsoil layer be avoided? This becomes a very important consideration on slopes and areas receiving high use or maintenance.

Also, the alternatives to topsoiling might be considered before proceeding. Organic matter of the correct type generally improves most poor soils whether they be sand, clay or infertile. Where sufficient time exists green manure crops can be grown or various forms of natural or organic residues can be incorporated. Local environmental wastes may be available and these can be put to use and serve the community. Some concerns with these materials could be pH problems, metal residues or short-term biological uncleanness. Except for the metal residues, these problems can be overcome.

What is the proper decision on topsoiling for establishing turf?

Where topsoil exists give it proper care and put it to good use. Store topsoil on well-drained sites in such a fashion that large, tightly sealed piles are avoided. Keep weeds under control. Manage a minimum of handling and tillage to preserve the physical condition of the topsoil and avoid loss of organic matter. Avoid spreading and tillage of topsoil when it is wet. In closing, rarely is it desirable to dissipate and waste topsoil. □