UPDATED CHECKLIST OF ELM (ULMUS) CULTIVARS FOR USE IN NORTH AMERICA

by Frank S. Santamour, Jr. and Susan E. Bentz

Abstract. This checklist, with more than 175 entries, covers all elm cultivars introduced since 1964 and complete listings for *Ulmus americana*, *U. japonica*, *U. parvifolia*, *U. pumila*, *U. wilsoniana*, and all cultivars of putative hybrids in which at least one parent species was native to North America. Information on potential resistance to Dutch elm disease (DED), elm yellows, and other diseases and pests is included.

The Arnold Arboretum of Harvard University has been, and continues to be, the recognized International Registration Authority for cultivar names in *Ulmus* (elm). Peter S. Green (Arnoldia 24(6-8): 41-80, 1964) published a comprehensive listing of 404 entries in 1964, and it would be difficult to improve on that work, especially in an historical context.

However, 30 years have passed and there continues to be great interest in the elms, especially for resistance to Dutch elm disease (DED), in Europe and North America. Also, more than 80% of the name-entries in Green's list referred to leaf and form variants of European species that are probably susceptible to DED and cannot be recommended for future use in North America. We have been granted permission by the Arnold Arboretum to publish this updated and amended cultivar checklist.

In so doing, we have attempted to include: 1) all cultivar names published since 1964, regardless of species or geographic origin; 2) all cultivar names of North American taxa or of hybrids in which at least one of the parent species is native to North America; 3) all cultivars of exotic species or hybrids selected in North America; 4) all cultivars of European origin and introduction that were selected for resistance to DED; and 5) all cultivars of Asiatic species with potential resistance to DED, including *U. japonica*, *U. parvifolia* (including those used as bonsai) *U. pumila*, and *U. wilsoniana*.

Obviously, to achieve our goals, we have had to repeat the listing of many names that were given in Green's work. For most of these older cultivars, we have simply referenced them to "P. S. Green," and included a brief description. For other pre-1964 cultivars, we have provided amended descriptions.

Rather than list all of these cultivars in alphabetical order, with textual reference to species or hybrid identity (as in Green), we have chosen to present the listings by various categories, in the following sequence:

1. *Ulmus americana* L.
2. *Ulmus japonica* (Rehd.) Sarg.
3. *Ulmus parvifolia* Jacq.
4. *Ulmus pumila* L.
5. *Ulmus wilsoniana* Schneid.
6. North American Hybrids and Selections
7. Selections of European Origin

Some trees that were products of research at the University of Wisconsin have been given "registered" names in France and Germany and are fully described under "North American Hybrids and Selections" and merely listed under "Selections of European Origin."

Because of the format used, and the relatively small numbers of cultivars in any of these categories, we do not believe that we have imposed any undue burden on readers searching for a particular name. Within each category, the entries are listed alphabetically, with **VALID CULTIVAR** names in boldface capitals and INVALID CULTIVAR names in lightface capitals.

New elm cultivars continue to be introduced at an accelerated pace and this checklist will soon be out of date. Thus, we have listed **PATRIOT** (U.S. National Arboretum) and **CHARISMA** (Morton Arboretum) as valid cultivar names under "North American Hybrids and Selections" since their

publication was pending at the time of preparation of this checklist.

Ulmus americana

AMERICAN LIBERTY (E. B. Smalley and R. P. Guries, The Grass Roots (Wisconsin Golf Course Superintendents Assoc.) 13(4): 42-43, 1986) - name used to denote a "multiclonal variety" composed originally of six selections, clonally propagated, from the University of Wisconsin research program to develop American elms resistant to DED. Commercial development assigned to the Elm Research Institute, Harrisville, New Hampshire. Five of the clones were derived from testing of more than 8000 progeny from crosses (1969-1970) of the more resistant selections from the Wisconsin program with similar trees selected at Cornell University and USDA, and one of these five has been patented as **INDEPENDENCE**. The sixth clone was the sole survivor of 1000 seedlings obtained from Kansas in 1957. Thus, **AMERICAN LIBERTY** is now a mixture of six clones with typical upright vase-shaped crowns and a high degree of resistance to DED. Excellent summary of development by E. B. Smalley, R. P. Guries, and D. T. Lester in Dutch Elm Disease Research: Cellular and Molecular Approaches (Eds. M. M. Sticklen and J. L. Sherald) pp. 26-45, Springer-Verlag, 1993. Trees of **AMERICAN LIBERTY** noted as highly susceptible to elm yellows (phloem necrosis) in New York (W. A. Sinclair, H. G. Griffiths, and I.-M. Lee, J. Arboric. 20: 176-189, 1994).

ASCENDENS (P.S. Green) - fastigiate tree with narrow oval crown growing (in 1927) in Seneca Park, Rochester, New York.

AUGUSTINE (P.S. Green) - fastigiate tree selected in 1927 in Bloomington, Illinois. (Has proved susceptible to DED).

AUGUSTINE ASCENDING (P.S. Green) = **AUGUSTINE**

AUREA (P.S. Green) - tree with yellow foliage found in Vermont by F.L. Temple *ca.* 1902.

BEAVERLODGE (P.S. Green) - upright tree with moderately spreading crown selected in 1925 in Morden, Manitoba.

BEEBE'S WEEPING (P.S. Green) - tree with thick, cord-like, weeping branches propagated (*ca.* 1889) from a wild tree near Galena, Illinois.

BRANDON (Lacombe Nurs., Lacombe, Alberta, Canada, Spring 1969 Cat., p.6) - as "Brandon Elms, more pyramidal than the regular American elm." Probably = **PATMORE**.

BRANDON ASCENDING (Proc. 27th Ann. Mtg. Western Canad. Soc. Hort.; Lac Du Bonnet, Manitoba; Feb. 15-17, 1971, p. 17) - as "Brandon Ascending," from Patmore Nurs., Brandon, Manitoba. Probably = **PATMORE**.

BURGOYNE - Name found in records of the Plant Sciences Data Center of the American Horticultural Society. Tree growing at the Arnold Arboretum; disposed of in 1988. Grown from seeds of the "Burgoyne elm"; seedlings grown for town of Weston, Massachusetts for historical purposes in 1965.

COLLEGE (Wedge Nurs., Albert Lea, Minnesota, Cat. 1961) - as "ELM COLLEGE (Choice variety of Am. elm)."

COLUMNARIS (P.S. Green) - a columnar tree discovered (*ca.* 1921) in New York.

DED-FREE - Name found in the records of the Plant Sciences Data Center of the American Horticultural Society. Tree at the Arnold Arboretum of Harvard University obtained from Princeton Nurs., Princeton, New Jersey in 1973. Plant Patent No. 3108, April 11, 1972, by William J. Flemer and William Flemer III (Princeton). Original tree selected as only survivor (late 1940's) among a grove of trees following natural devastation by DED and subsequently proved resistant by artificial inoculations. However, tree never offered for public sale or distribution. The name was never validly published and originator has suggested that it not be validated.

DELAWARE (Princeton Nurs., Princeton, New Jersey, Wholesale Price List, Fall 1985 - Spring 1986, p. 82) - as "Delaware #2." A product of USDA research, but never officially released. Tree (No. 218) selected for resistance to DED by Curtis May, (USDA) in Morristown, New Jersey. Originated in a group of 100 seedlings purchased in 1940 from a North Dakota nurserymen who collected seeds locally. Tree moved from New Jersey to U.S. National Arboretum, Washington D.C. in April, 1948. This was one of two disease-resistant trees so moved, the other being No. 252. Both of these trees were reported to be susceptible to phloem necrosis (elm yellows) by R.R. Whitten and R.U. Swingle (Proc. Nat. Shade Tree Conf. 24:113-119, 1948). Research on this tree taken up by USDA-ARS laboratory in Delaware, Ohio. Subsequently propagated and distributed for evaluation as "Delaware #2." ("Delaware #1" became **URBAN**). Inoculations of original tree (by F.S.Santamour, Jr.) and propagules (A.M. Townsend and L.R. Schreiber, Proc. Central States Forest Tree Improve. Conf. 9: 1-6, 1975) with highly aggressive fungal isolates proved that this selection was highly resistant to DED. Original tree at National

Arboretum died in 1980 from unknown causes. We consider it best to validate the name **DELAWARE**, removing the confusing "#2."

DELAWARE #2 = **DELAWARE**

EXHIBITION (P.S. Green) - tree with narrow, vase-shaped crown selected from seedlings of Manitoba origin. Probably = **PATMORE**

EXHIBITION BOULEVARD = **PATMORE**

FASTIGIATA (P.S. Green) = **FIOREI**.

FIOREI (P.S. Green) - tree with narrow form and dense growth introduced *ca.* 1948.

FOLIA AUREA VARIEGATA (P.S. Green) - tree with yellow-variegated leaves that originated in Europe *ca.* 1865.

GLABRA (P.S. Green) = PENDULA (Neither name should be valid as a cultivar).

HINES - listed in the holdings of the Morden Arboretum (1970); apparently a selection from Hines Nurs., Souris, Manitoba, obtained in 1940.

INCISA (P.S. Green) - described from Europe in 1838 as having more deeply serrated leaves.

INDEPENDENCE (Plant Patent No. 6227, July 19, 1988) - patented by Eugene B. Smalley and Donald T. Lester and assigned to the Elm Research Institute, Harrisville, New Hampshire. Product of a controlled cross between 'Moline' (as female) and another American elm (W 185-21) initially grown at Interstate Nurs., Hamburg, Iowa; research carried out at the University of Wisconsin, Madison. Tree is "one of a number of clones known as 'American Liberty' elms demonstrating resistance to disease, particularly Dutch elm disease, and possessing a desirable upright vase-shape and vigorous growth habit."

IOWA STATE (Anon., Amer. Horticulturist - News Edition, 63(5):4, 1984) - in a listing of disease-resistant elms, "developed by Dr. Harold S. McNabb at Iowa State University." A natural selection from southeastern Iowa that was highly resistant to inoculation with DED. Trees given to Donald C. Willeke, Minneapolis, Minnesota and apparently planted in that city.

ISU - IOWA STATE

JACKSON(Arborvillage Farm Nurs., Holt, Missouri, Cat Fall 1994 - Spring 1995, p. 41) - a selection from Wichita, Kansas "showing no disease damage at 50+ years of age." Not tested for DED resistance by artificial inoculation.

JEFFERSON (J. L. Sherald, F. S. Santamour, Jr., R. K. Hajela, N. Hajela, and M. B. Sticklen. Can. J. For. Res. 24: 647-653, 1993) - a naturally occurring triploid hybrid between the tetraploid American elm and an unknown diploid species. Originally selected (NPS 3-487) by H. V. Wester, National Park Service, from trees planted on the National Mall in Washington, DC. Resistance to DED proved by twig-crotch inoculations. Although a hybrid, tree form approaches that of American elm. Soon to be released for further evaluation.

KIMLEY (P.S. Green) - tree with pendulous branches selected near Oshawa, Ontario *ca.* 1957.

KLEHM (P.S. Green) = **KLEHMII**

KLEHMII (P.S. Green) - vase-shaped tree selected in Arlington Heights, Illinois ca. 1929.

LAKE CITY (P.S.Green) - upright, vase-shaped tree described in 1940.

L'ASSOMPTION (C. -E. Ouellet and R. Pomerleau, Canad. J. Bot. 43:85-96, 1965)- a slow-growing tree, highly resistant to DED, selected from seedlings grown from X-irradiated seed at the experiment station in L'Assomption, Quebec.

LIBERTAS (D. Robinson, Amer. Nurseryman 165(9): 121-122, 124, 126, 128, 1987) - as Ulmus americana libertas to denote **AMERICAN LIBERTY**.

LIBERTY - name found in various popular publications and in literature of the Elm Research Institute, Harrisville, New Hampshire, to denote **AMERICAN LIBERTY**.

LITTLEFORD (P.S. Green) - tree with narrow, vase-shaped crown selected in Hinsdale, Illinois and first marketed in 1927.

LITTLEFORD II (P.S. Green) = **LITTLEFORD**

MARKHAM (P.S. Green) - extremely pendulous tree selected at Avon, New York prior to 1950.

MINNEAPOLIS PARK (P.S. Green) - a selection made in Minneapolis, Minnesota prior to 1958.

MINNEAPOLIS PARK BOARD (P.S. Green) = **MINNEAPOLIS PARK.**

MOLINE (P.S. Green) - tree with narrow crown selected near Moline, Illinois and propagated first in 1916. (Highly susceptible to aggressive and semi-aggressive DED isolates: J.N. Gibbs, et al., Eur. J. Plant Path. 5:161-174, 1975).

MOLINENSIS (P.S. Green) = **MOLINE**

MORDEN (P.S. Green) - tree with ability to resist ice storms selected in 1939 in Morden, Manitoba.

NIGRESCENS (P.S. Green) = **NIGRICANS**

NIGRICANS (P.S. Green) - tree with dark green leaves selected in Germany prior to 1885.

PATMORE (Patmore Nurs. Sales, Brandon, Manitoba, Canada, Cat. 1979)- as U. americana 'Patmore' as description of listing "Patmore Ascending." Historically, listed as "Grafted Elm" in 1945 Cat. and 1955 Cat., as "Exhibition Boulevard Elm (Grafted)" in 1958 Cat., as "Grafted ascending elm" in 1966 Cat., and as "Patmore Ascending Elm" in 1973 Cat. Selected and propagated by R.H. (Dick) Patmore from native

tree in Brandon, Manitoba with upright compact form.

PATMORE ASCENDING = **PATMORE**

PENDULA (P.S. Green) = **BEEBE'S WEEPING**

PENN TREATY - Name found in the records of the Plant Sciences Data Center of the American Horticultural Society. Plants growing at the Morris Arboretum of the University of Pennsylvania, Philadelphia. Grafts made in 1945 from a tree at Haverford College which was itself a graft from the famous Shackamaxon Treaty elm which grew in Penn Treaty Park, Kensington, Philadelphia. It was under this elm that William Penn was alleged to have signed a treaty (in 1683) with the Indians. Whether or not such an event occurred, the painting by Benjamin West has immortalized the scene. Cultivar name validated here for historical reasons.

PRINCETON (P.S. Green) - vase-shaped selection made in 1922 for vigorous growth and some resistance to elm leaf beetle. (We have found that this cultivar has been highly tolerant to artificial inoculation with aggressive strains of the DED fungus).

PYRAMIDALIS (P.S. Green) = **PYRAMIDATA**

PYRAMIDATA (P.S. Green) - pyramidal tree found in France prior to 1880.

QUEEN CITY (P.S. Green) - horizontally branched vase-shaped tree selected about 1944 in Toronto, Ontario.

SHEYENNE (Plumfield Nurs., Fremont, Nebraska, Wholesale Trade List; March 1, 1965, p. 12)- without description.

SKINNER UPRIGHT - also as Skinner's Upright, plants growing in the arboretum of the Morden, Manitoba Research Station. From Skinner's Nurs., Roblin, Manitoba; planted in 1954.

STAR (P.S. Green) - tree with globe-shaped crown selected and propagated in Nebraska about 1945.

VARIEGATA (P.S. Green) - tree with spotted white leaves selected in Europe prior to 1863.

VASE (P.S. Green) = VASEYI, with neither name being valid.

VASEYI (P.S. Green) = VASE, with neither name being valid.

WASHINGTON (P.S. Green) - propagations from the tree, in Cambridge, Massachusetts, under which George Washington took command of colonial troops in 1775. There is some question as to whether the original tree, or, at least, the propagations purportedly made from it, was truly American elm.

WASHINGTON (Princeton, Nurs. Princeton, New Jersey, Wholesale Price List, Fall 1985 - Spring 1986, p. 82) - a selection (NPS 3-178) of supposed American elm made by H. V. Wester, National Park Service, from trees planted on the National Mall, Washington, D.C., but never officially released. Resistance to DED tested by twig-crotch inoculations. Recent research in 1993 (F.S. Santamour, Jr., unpublished) has shown that this tree, like **JEFFERSON**, is also a triploid hybrid of American elm and an unknown diploid species (perhaps different than that involved in **JEFFERSON**). The valid cultivar name **WASHINGTON** has already been published, and regardless of whether **WASHINGTON** is really an American elm, a new name must be applied to this cultivar.

Ulmus japonica

JACAN (W.G. Ronald, Can. J. Plant Sci. 59: 267-268, 1979) - a selection of *U. japonica* from Manitoba; resistant to DED.

MITSUI CENTENNIAL (S.A. Spongberg, AABGA Bull. 14: 97-100, 1980) - a selection (1976) of *U. japonica* by W.G. Ronald at the Morden Research Station in Manitoba, fast-growing and resistant to DED. Named to commemorate the centennial year (1981) of the Japanese firm of Mitsui & Co.

REPERTA - Name registered in Germany in 1993 by Conrad Appel KG, Darmstadt for a University of Wisconsin selection (43-8) of *U. japonica*. Not available in North America at present but may be patented soon under another name in the United States.

THOMSON (C.H. Lindquist and J.A.G Howe, Can. J. Plant Sci. 59: 1159, 1979) - a selection of *U. japonica* from Saskatchewan; resistant to DED; only ca. 24 feet in height after 25 years.

Ulmus parvifolia

ACROSS CENTRAL PARK (M.A. Dirr and A.E. Richards, Amer. Nurseryman 169(3): 37-43, 46-49, 1989) - name erroneously used to denote cultivar **AROSS/CENTRAL PARK**.

ALLEE® - Trademark name of cultivar first called EMERALD VASE (M.A. Dirr and A.E. Richards, Amer. Nurseryman 169 (3): 37-42, 46-49, 1989) and later patented as **EMER II** (Plant Patent No. 7552, June 11, 1991).

AROSS/CENTRAL PARK (Plant Patent No. 6983, August 15, 1989) by David F. Karnosky. Name published without the slash between "Aross" and "Central" by D.F. Karnosky, HortScience 23:925-926, 1988. Propagated from a specimen in Central Park, New York City, believed to be the largest and oldest (100 + years) in the United States; selected for potential cold hardiness and tolerance of urban

growing conditions. In choosing the cultivar name, the introducer wished to commemorate Arthur Vining Ross, but some confusion has resulted (see ACROSS CENTRAL PARK).

ATHENA® - Trademark name of cultivar first called EMERALD ISLE (M.A. Dirr and A.E. Richards, Amer. Nurseryman 169 (3): 37-42, 46-49, 1989) and later patented as **EMER I** (Plant Patent No. 7551, June 11, 1991).

AUREA - Mentioned as a possible synonym for GOLDEN RAY (**GOLDEN REY**) by M.A. Dirr, Nursery Manager 9(6): 30, 32-33, 1993. There were two accessions of AUREA growing in the collections of Sunshine Farm and Nursery, Clinton, Oklahoma in 1994 that originated at the Southern Great Plains Field Station (USDA) in Woodward, Oklahoma. Not a valid cultivar name because in Latin form after 1955.

BREA (P.S. Green) = **DRAKE**

BURGUNDY (M.A. Dirr, Manual of Woody Landscape Plants, Ed. 4, Stipes Publ. Co., Champaign, Illinois, 1990, p. 878) - selected by M.A. Dirr and A.E. Richards from University of Georgia campus. Parent tree 8 years old; 18 feet tall with 20-foot crown spread. Named for fall color of foliage.

CATLIN (J.R. Barrett, Intern. Bonsai 2(3):11, 1980) - selected as a bud sport *ca.* 1950 by John Catlin of La Canada, California for potential use as a bonsai plant. Extremely small leaves (1/4 to 1/2 inch) remain evergreen on containerized plants in California.

CORK BARK (Forest Farm, Cat. Fall 1989) - with "especially corky bark, for bonsai and specimen use." Apparently introduced from Japan in 1973 (W. B. Stone, Intern. Bonsai 2(3):12-15, 1980).

CULLY SELECTION - described by M.A. Dirr, Nursery Manager 9(6): 30, 32-33, 1993 as a cultivar that originated as a seedling of **ELSMO** that was resistant to canker and survived temperatures as low as -28°F. Not a valid name.

D. B. COLE (Arborvillage Farm Nurs., Holt, Missouri, Cat. Fall 1991 - Spring 1992, p. 21) - smaller growing with dense head.

DRAKE (P.S. Green) - a selection from Monrovia Nurs., Azusa, California; ca 1952; with "rich evergreen foliage on sweeping branches which grow more upright than the regular evergreen elm."

DYNASTY (F.S. Santamour, Jr., HortScience 19:898-899, 1984) - the product of a controlled cross between two trees of Korean origin. Deciduous small tree with vase-shaped crown. Recommended for planting in tree lawns under power lines.

ELSMO - released by the USDA, Soil Conservation Service, Plant Materials Center, Elsberry, Missouri in 1990 as an open-pollinated, seed-propagated cultivar. Progeny extremely variable (M.A. Dirr, Nursery Manager 9(6): 30, 32-33, 1993).

EMER I (Plant Patent No. 7551, June 11, 1991) by M.M. Glenn. First published as EMERALD ISLE (M.A. Dirr and A.E. Richards, Amer. Nurseryman 169(3): 37-43, 46-49, 1989); later trade marked as ATHENA. Tree selected on the University of Georgia campus in Athens; at 70-75 years of age, the globe-shaped crown was 30 feet high and 54 feet wide; attractive exfoliating bark.

EMER II (Plant Patent No 7552, June 11, 1991) by M.M. Glenn, J.H. Barbour, and M.A.Dirr. First published as EMERALD VASE (M.A. Dirr and A.E. Richards, Amer. Nurseryman 169(3): 37-42, 46-49, 1989) and later trademarked as ALLEE. Tree selected on the University of Georgia campus in Athens; at 80-90 years of age, vase-shaped crown was 70 feet high and 59 feet wide; attractive exfoliating bark.

EMERALD ISLE = **EMER I**

EMERALD VASE = **EMER II**

EVERGREEN (P.S. Green) =**SEMPERVIRENS**

FROSTY (Mitsch Nurs., Salem, Oregon, Wholesale Price List, 1989, p. 23) - "Charming, slow-growing plant with variegated foliage."

GARDEN CITY CLONE (M.A. Dirr, Nursery Manager 9(6): 30, 32-33 1993) - as a cultivar from Kansas; champion tree 60 feet tall. Not a valid name.

GEISHA (Hanno Hardijzer b.v., Boskoop, Netherlands, Cat. 1989, p. 30) - with very small variegated leaves, suitable for bonsai.

GLOBE - mentioned in some anonymous notes as a synonym for **EMER I**. Not a valid name.

GOLDEN REY (Plant Patent No. 7240, June 5, 1990) by B. Rey. New leaves uniform light yellow, maturing to near chartreuse yellow. Full description in Amer. Nurseryman 175(4):62, 1992. Sometimes misspelled as GOLDEN RAY.

HALLELUJAH (Arborvillage Nurs., Holt Missouri, Cat. Fall 1993 -Spring 1994, p. 31) - fast growing; withstood -35°F.

HOKKAIDO - an older cultivar of Japanese origin. According to W.N. Valvanis (Proc. Intern. Plant Prop. Soc. 32:502-508, 1982) the plant is "too small for common size bonsai."

KING'S CHOICE (Plant Patent No. 5554, September 10, 1985) - selected from over 1000 seedlings for upright crown and outstanding growth (22 feet at 7 years); good yellow autumn leaf color in Maryland. Selected by Benjamin J. King, King's Men Tree Farms, Hampstead, Maryland.

MICROPHYLLA = **HOKKAIDO**

MILLIKEN (M.A. Dirr, Nursery Manager 9(6): 30, 32-33, 1993 - originated in Spartanburg, South Caro-

lina; large, billowy white oak form with attractive exfoliating bark.

NANA VARIEGATA = **GEISHA**

OHIO (Princeton Nurs., Princeton, New Jersey, Wholesale Cat., Fall 1991 - Spring 1992, p. 103)- reddish foliage in autumn. Developed by A.M. Townsend, USDA, ARS, U.S. National Arboretum, and officially released February 14, 1992. Also described and illustrated in Amer. Nurseryman 176(12): 72, 1992.

ORANGE RIBBON 740 (O.M. Lindstrom and M.A. Dirr, HortScience 26: 290-292, 1991) - as a cultivar tested for cold hardiness. Not considered as a valid name because of lack of description.

PATHFINDER - Registered in 1990 with the Arnold Arboretum (S.A. Spongberg, HortScience 26: 476, 1991). Developed by A.M. Townsend, USDA, ARS, U.S. National Arboretum. Tree 11.3 m tall and 9.7 m wide at age 27; leaves turn brilliant red in autumn. Also described in Amer. Nurseryman 175(4): 42, 1992.

PENDENS (P.S. Green) - with long, loosely pendulous branches; originated in California before 1930. Probably never available in the nursery trade.

PRAIRIE SHADE (C.E. Whitcomb and G.G Hickman, HortScience 21:162-163, 1986) - selected from about 800 seedlings planted in 1973 in Oklahoma; young plants developed a strong upright growth habit.

PYGMAEA = **HOKKAIDO**

RED FALL (M.A. Dirr, Nursery Manager 9(6): 30, 32-33, 1993) - as a cultivar ('Red') selected by S. Bieberich, Sunshine Farm and Nursery, Clinton, Oklahoma for red fall color of foliage. **RED FALL** *preferred by originator.*

SEIJU (H.C. Young, and S. Young, Intern. Bonsai 2(3): 28, 1980) - apparently a sport of **HOKKAIDO** that originated in 1975; with larger leaves more suitable for bonsai.

SELECT 380 (O.M. Lindstrom and M.A. Dirr, HortScience 26: 290-292, 1991) - as a cultivar tested for cold hardiness. Not considered as a valid name because of lack of description.

SEMPERVIRENS (P.S. Green) - considered as a cultivar, but name only denotes that plants may be evergreen under certain conditions; may be seed-propagated.

STATE FAIR - listed in the holdings of Sunshine Farm and Nursery, Clinton, Oklahoma in 1994. Original tree on grounds of Oklahoma State Fair, Oklahoma City, Oklahoma. Globe-shaped crown with dense foliage and excellent exfoliating bark. Name validated here for first time.

STONE'S DWARF (W. B. Stone, Intern. Bonsai 3(1): 16-17, 1981) - dwarf selection with rough, but not corky, bark; first sold in 1978.

SUBEROSA = **CORK BARK**

THE THINKER (M.A. Dirr, Nursery Manager 9(6): 30, 32-33, 1993) -as a cultivar selected by M. Hayman on the University of Louisville (Kentucky) campus; rounded habit; exfoliating bark. Named for proximity to statue by Rodin.

TRUE GREEN (Monrovia Nurs., Azusa, California, Wholesale Cat. 1971, p. 82) as Ulmus parvifolia sempervirens 'True Green,' a new and more evergreen variety of Elm. Makes a graceful, round headed small tree."

YATSUBUSA (W.N. Valavanis, Proc. Intern. Plant Prop. Soc. 32:502-508, 1982) used as both a cultivar name and as a group name to designate especially small-leaved variants suitable for bonsai culture.

Ulmus pumila

ANSALONI (P.S. Green) - introduced in 1935 in Italy.

AURESCENS (P.S. Green) - a plant with yellowish new foliage discovered in Germany in the 1890's.

CHINKOTA (P.S. Green) - seed-propagated line selected in 1950's for use in the Great Plains. May be the same as **DROPMORE**; see also HARBIN, HARBIN STRAIN, MANCHU.

DROPMORE (P.S. Green) - *name proposed to replace* CHINKOTA, HARBIN, HARBIN STRAIN, and MANCHU, since plants given these names were all raised from the same collection from Harbin, Manchuria.

HARBIN (P.S. Green) = **DROPMORE**

HARBIN STRAIN (P.S. Green) = **DROPMORE**

MANCHU (P.S. Green) = **DROPMORE**

MR. BUZZ (M.A. Dirr, Manual of woody landscape plants, Ed. 4, 1990, p. 882) - a selection by Westerveldt Tree Co., Selma, Alabama; vigorous growth, dense crown, and dark green foliage. Not presently in commerce.

PARK ROYAL (Sheridan Nurs., Etobicoke, Ontario, Canada, Trade List, Spring 1969, p. 22) - "improved specimen, fast growing.

PENDULA (P.S. Green) - described in 1845 from Europe.

PYRAMIDALIS FIOREI (P.S. Green) - a pyramidal selection made in 1950 in Prairie View, Illinois.

SIBERICA (P.S. Green) = **PENDULA**

Ulmus wilsoniana

PROSPECTOR (A.M. Townsend, L.R. Scheiber, W.O. Masters, and S.E. Bentz, HortScience 26: 81-82,

1991) - the first cultivar of *U. wilsoniana* named; highly resistant to DED and elm leaf beetle and probably resistant to mycoplasma-caused elm yellows; with dense, somewhat vase-shaped crown.

North American Hybrids and Selections

ACCOLADE (R.P. Guries and E.B. Smalley, Proc. Third Nat. Urban Forestry Conf. Orlando, Florida, pp. 214-218, 1986) - as a cultivar of *U. japonica* x *U. wilsoniana* parentage to be released by the Morton Arboretum, Lisle, Illinois. Selected from plants grown from seed (labelled *U. crassifolia*!) received in 1924 from the Arnold Arboretum. George H. Ware determined its putative parentage from a comparison with authentic specimens derived from controlled crosses. Tree with splendid vase shape and extraordinarily deep green, glossy leaves according to G. Ware, Morton Arb. Quarterly 28(1): 1-5, 1992, who also noted its resistance to DED, elm leaf beetle, and leaf miner.

BOULEVARD (P.S. Green) = **ROSEHILL**

BROADLEAF HYBRID - P.S. Green considered this to be synonymous with **GREEN KING** but it was a product of Neosho Nurs., Neosho, Missouri whereas **GREEN KING** was from Henry Field (Nurs.) in Shenandoah, Iowa. Most likely a natural hybrid between *U. pumila* and *U. rubra*. Not widely tested for resistance to DED.

CATHEDRAL (Plant Patent No. 8683, April 12, 1994) - by E. Smalley and D.T. Lester and assigned to the Wisconsin Alumni Research Foundation, Madison, Wisconsin. A putative hybrid between U. pumila and U. japonica grown from seed collected in 1958 from the Botanical Garden of Hokkaido University in Sapporo, Japan. The same seedlot produced **SAPPORO AUTUMN GOLD**. Although slightly less resistant to DED than **SAPPORO AUTUMN GOLD**, **CATHEDRAL** is highly tolerant to Verticillium wilt and is resistant to attack by the elm leaf miner.

CHARISMA - Soon to be published as a valid cultivar name by George H. Ware, Morton Arboretum, Lisle, Illinois. Tree is a control-pollinated hybrid between **ACCOLADE** and **VANGUARD**, thus including germplasm of *U. japonica*, *U. pumila*, and *U. wilsoniana*. Somewhat American elm-like in form with the deepest green and glossiest foliage of any elm ever seen by the introducer (G.H. Ware, pers. comm.).

COOLSHADE (P.S. Green) - a natural hybrid between *U. pumila* and *U. rubra* introduced by Sarcoxie Nurs., Sarcoxie, Missouri in 1951. Not widely tested for resistance to DED.

DANADA (R.P. Guries and E.B. Smalley, Proc. Third Nat. Urban Forestry Conf., Orlando, Florida, pp. 214-218, 1986) - a cultivar derived from open pollination of a hybrid between *U. japonica* and *U. wilsoniana* to be released by the Morton Arboretum, Lisle, Illinois. Grown from seed collected from one tree in a group of five of this putative parentage and likely a second-generation hybrid. Name selected to "honor Dan and Ada Rice, namesakes of the nearby Danada Forest Preserve." Tree with vase shape and attractive emerging red foliage.

DELAWARE NO. 1 = **URBAN**

FIELD'S HYBRID = **GREEN KING**

FRONTIER (A.M. Townsend, L.R. Schreiber, W.O. Masters, and S.E. Bentz, HortScience 26: 80-81, 1991) - a hybrid between *U. carpinifolia* and *U. parvifolia* with a high degree of resistance to DED, moderate resistance to elm leaf beetle, and probable resistance to the mycoplasma-caused elm yellows; tree with pyramidal crown and red-purple autumn leaf color.

GREEN KING (P.S. Green) - a 1960 trademark name to denote a plant earlier distributed as Field's (or Henry Field's) Hybrid elm. Probably a hybrid between *U. pumila* and *U. rubra*. Not widely tested for resistance to DED.

HAMBURG (P.S. Green) - probably a hybrid between *U. pumila* and *U. rubra*, but originally thought to be *U. americana* x *U. pumila*. Not widely tested for resistance to DED.

HANSEN'S HYBRID (Jewell Nurs., Lake City, Minnesota, Wholesale Price List Fall 1968 - spring 1969, p. 6) - "with larger leaf than Chinese." No data on origin or parentage.

HOMESTEAD (A.M. Townsend and W.O. Masters, HortScience 19: 897-898, 1984) - a hybrid between *U. pumila* and a complex hybrid (*U. x hollandica* 'Vegeta' x *U. carpinifolia*) x (*U. pumila pinnato-ramosa* x *U. carpinifolia* 'Hoersholmiensis') from the Netherlands elm breeding program. Highly resistant to DED; fast growing, pyramidal form.

IMPROVED COOLSHADE (P.S. Green) - Plant Patent No. 1747, September 9, 1958 by A.O. Wild, Sarcoxie, Missouri. A seedling of **COOLSHADE**. Not widely tested for resistance to DED.

KANSAS HYBRID (P.S. Green) - although this name was considered valid by Green, the use of the term "hybrid" in a cultivar name is not valid. Most likely a hybrid between *U. pumila* and *U. rubra* and not widely tested for resistance to DED.

LINCOLN (Plant Patent No 5015, March 29, 1983, by S.E. Clegg, Plainfield, Illinois and C.P. McFarland, Urbana, Illinois) -a hybrid between *U. pumila* and *U.*

rubra first selected about 1958. Reported (in patent) to be resistant to DED, but not widely tested.

NEOSHO = BROADLEAF HYBRID

NEW HORIZON (Plant Patent No. 8684, April 12, 1994) - by E.B. Smalley and R.P. Guries and assigned to the Wisconsin Alumni Research Foundation, Madison, Wisconsin. A control-pollinated hybrid between *U. japonica* and *U. pumila*, with excellent resistance to DED and the elm leaf miner and high tolerance to Verticillium wilt.

OHIO HYBRID = **URBAN**

PATRIOT - a new hybrid cultivar released by USDA, ARS, November 3, 1993. Developed by A.M. Townsend, U.S. National Arboretum; highly resistant to Dutch elm disease and highly tolerant to elm leaf beetle. Cross made between **'URBAN'** and *U. wilsoniana* **'PROSPECTOR'** in 1980. Soon to be published in J. Environ. Hort.

PIONEER (A.M. Townsend and W.O. Masters, HortScience 19: 900, 1984) - a hybrid between *U. glabra* and *U. carpinifolia*. Tree with globe-shaped crown and a high degree of resistance to DED, very vigorous and fast-growing.

PRIMUS (P.S. Green) = **IMPROVED COOLSHADE**

REBONE - Name registered in Germany in 1993 by Conrad Appel KG, Darmstadt for a University of Wisconsin selection (916) that resulted from a controlled cross between U. japonica and U. pumila. A sister seedling of **NEW HORIZON** (917).

RECERTA (H. Maethe, Deutsche Baumschule, September, 1985, p. 368-369) - a new registered cultivar grown by Conrad Appel KG, Darmstadt, Germany. A selection (196-5) made at the University of Wisconsin from plants grown from seed collected from *U. pumila* in Volgagrad, Russia; parentage deduced to be *U. pumila* x *U. carpinifolia*. Somewhat resistant to DED. H.M. Heybroek, Tuin en Landschap 8(12): 19, 1986 has expressed doubts as to its suitability for long-term culture in Europe.

REGAL (E.B. Smalley and D.T. Lester, HortScience 18: 960-961, 1983) - a DED-resistant selection developed at the University of Wisconsin from a cross between **COMMELIN** (*U. x hollandica* 'Vegeta' x *U. carpinifolia*) and a plant of *U. pumila* x *U. carpinifolia* 'Hoersholmiensis' parentage.

REPURA - Name registered in Germany in 1993 by Conrad Appel KG, Darmstadt for a University of Wisconsin hybrid selection (1193-4) of complex parentage. The female parent was REGAL and the male parent was a cross between a plant of *U. pumila* x *U. japonica* parentage with U. rubra.

RESISTA (Andre' Briant Jeunes Plants, Saint-Barthelemy, France, Cat. 1990-1991, p. 65) - as *Ulmus* Resista with 'Sapporo Gold 2' in synonymy. Name registered in France for a plant selected at the University of Wisconsin of the same parentage as **SAPPORO AUTUMN GOLD**. Recommended as a hedge plant.

REVERA - Name registered in Germany in 1993 by Conrad Appel KG, Darmstadt for a University of Wisconsin selection (1193-3) of the same parentage as REPURA.

REVERTI - Name registered in Germany in 1993 by Conrad Appel KG, Darmstadt for a University of Wisconsin selection (380-1) of *U. carpinifolia*. This tree was grown from Hungarian seed and was the most disease-resistant *U. carpinifolia* in the Wisconsin program.

ROSEHILL (P.S. Green) - a hybrid between *U. pumila* and *U. rubra*, not widely tested for resistance to DED.

SAPPORO AUTUMN GOLD (E.B. Smalley and D.T. Lester, HortScience 8: 514-515, 1973) - a putative hybrid between *U. pumila* and *U. japonica* grown from seed collected in 1958 from the botanical garden of Hokkaido University, Sapporo, Japan. Selected at the University of Wisconsin for high resistance to DED and tolerance to Verticillium wilt. Upright tree with somewhat vase-shaped crown. Plant Patent No. 3780, September 9, 1975 by E.B. Smalley and D.T. Lester.

SAPPORO GOLD - Name used in Europe to denote **SAPPORO AUTUMN GOLD**.

SAPPORO GOLD 2 - Name used in France in synonymy of RESISTA.

SHAPIRO AUTUMN GOLD (C.E. Whitcomb, Know it and grow it, 1976, p. 171) - misprint for **SAPPORO AUTUMN GOLD**.

URBAN (L.R. Schreiber and H.V. Main, HortScience 11: 517-518, 1976) - selected from progeny of a controlled cross made in 1956 by Toru Arisumi (USDA, ARS, Columbus, Ohio). Female parent was the Netherlands selection N 148 (*U. x hollandica* 'Vegeta' x *U. carpinifolia*) and male parent was *U. pumila*. Highly resistant to DED, but somewhat susceptible to elm leaf beetle. Tree has strong central trunk and pyramidal crown habit. Propagated from stem cuttings. Distributed for testing as "Delaware No. 1."

VANGUARD (G. Ware, Morton Arb. Quarterly 28(1): 1-5, 1992) - a putative hybrid between *U. japonica* and *U. pumila* grown from open-pollinated seed of *U. japonica* received at the Morton Arboretum in 1980 from the Morden Research Station, Morden, Manitoba, Canada. Tree has all the characteristics desired for a superior elm selection.

WILLIS (P.S. Green) - probably a hybrid between *U.*

pumila and *U. rubra*; not widely tested for resistance to DED.

Selections of European Origin

BEA SCHWARZ (P.S. Green) (J.C. Went, Tijschr. Plantenziekten 60: 109-127, 1954) - selected and released about 1947 in the Netherlands for high resistance to DED. Originated in a group of seedlings from France, and considered a selection of *U. carpinifolia*. F.J. Fontaine, Dendroflora No. 5, p. 37-55, 1968 placed it under *U. x hollandica*. Introduced because of its resistance to *Nectria cinnabarina*, to which 'Christine Buisman' was susceptible. Tree slow growing and poor form; no longer grown in the Netherlands. Bea Schwarz was the first to describe the fungus causing DED.

BUISMAN (P.S. Green) = **CHRISTINE BUISMAN**

CHRISTINE BUISMAN (P.S. Green) (J.C. Went, Phytopath. Zeitschr. 11: 181-201, 1938) - selected in 1932 in the Netherlands for high resistance to DED from a 1929 shipment of 390 elm (*U. foliacea*) from Spain, and released about 1935. Considered a cultivar of *U. carpinifolia*, and released about 1935. Although highly resistant to inoculation with aggressive isolates of Dutch elm disease (J.N. Gibbs et al., Eur. J. Forest Path. 5: 161-174, 1975), this cultivar is no longer grown in the Netherlands because of its susceptibility to *Nectria cinnabarina*. Christine Buisman originated the elm hybridization work in the Netherlands.

CLUSIUS (H.M. Heybroek, In Research on Dutch elm disease in Europe, Forestry Comm. Bull. No. 60, 1983, p. 108-113) - selected in the Netherlands for high resistance to aggressive strains of DED. Same parentage as '**LOBEL**' [(*U. glabra* 'Exoniensis' x *U. wallichiana*) x (*U.* 'Bea Schwarz' x self)], but with larger and greener leaves and increased diameter growth. Named for the 16th century botanist Carolus Clusius.

COLUMELLA (H.M. Heybroek, Groen 46(2): 37-39, 1990) - a narrow, columnar tree with the highest degree of resistance to DED of any of the Dutch hybrids. Derived from open pollination of 'Plantyn' and has slightly curled leaves. Named for the Spanish-Roman agricultural writer Columella.

COMMELIN (H.M. Heybroek, Ned. Bosbouw. Tijdschr. 33: 325-328, 1961) - derived from a 1940 cross between *U. carpinifolia* (seedling obtained from a French nursery in 1929) and *U. x hollandica* 'Vegeta'. Selected for resistance to DED, but apparently only non-aggressive or semi-aggressive isolates of the fungus were used in the screening process. Found to be susceptible to aggressive isolates (J.N. Gibbs, et al., Eur. J. Forest Path. 5: 161-174, 1975) and, according to H.M. Heybroek, In For. Comm. Bull, No. 60, 1983, p. 108-113, this cultivar is seldom planted at the present time.

DEN HAAG - According to H.M. Heybroek, Tuin en Landschap 8(12): 19, 1986, this cultivar is a hybrid between *U. pumila* and *U. x hollandica* 'Belgica' that was developed by S.G.A. Doorenbos in the Netherlands in 1936. Although grown for many years, the name was not included in the compilation of F.J. Fontaine, Dendroflora No. 5, p. 37-55, 1968, but it is currently available in the Dutch nursery trade. Somewhat resistant to DED but has brittle branches and is susceptible to *Nectria cinnabarina*. Den Haag is the Dutch name for the city called "The Hague" in English.

DODOENS (H.M. Heybroek, Ned. Bosbouw. Tijdschr. 48: 117-123, 1976) - selected in the Netherlands for high resistance to aggressive strains of DED. Derived from open-pollination of a tree of *U. glabra* 'Exoniensis' x *U. wallichiana* parentage (the same tree that was the female parent of 'Clusius', 'Lobel', and 'Plantyn'). Tree with somewhat narrow crown like others with 'Exoniensis' ancestry. Named for Rembert Dodoens, a 16th century herbalist.

GROENEVELD (H.M. Heybroek, Plant Disease Rep. 48: 187-189, 1964, transl. by F.W. Holmes) - a cultivar of *U. x hollandica*, derived from crossing *U. glabra* with *U. carpinifolia* of French origin, released in 1963. Straight, dense-crowned tree with good resistance to DED and *Nectria cinnabarina*.

IEPLAAN - a name used in the past for the tree now known as **DEN HAAG.**

JACQUELINE HILLIER (D. Wyman, Arnoldia 27(6): 61-66, 1967) - registered with the Arnold Arboretum as a cultivar of *U. x elegantissima* (*U. glabra x U. plotii*). Introduced by Hillier & Sons, Winchester, England as a "small tree or suckering shrub with densely hairy twigs and small neat leaves." Reaction to Dutch elm disease unknown.

LOBEL (H.M. Heybroek, Ned. Bosbouw. Tijdschr. 48: 117-123, 1976) - selected in the Netherlands for high resistance to aggressive strains of DED. Derived from a cross of *U. glabra* 'Exoniensis' x *U. wallichiana* (as female) with a selfed seedling of 'Bea Schwarz'. Tree with narrow upright crown and smallish leaves. Named for the 16th century botanist Mathias de L'Obel.

PLANTYN (H.M. Heybroek, Ned. Bosbouw. Tijdschr. 48: 117-123, 1976) - selected in the Netherlands for high resistance to aggressive strains of DED. Derived from a cross of the *U. glabra* 'Exoniensis' x *U. wallichiana* hybrid with a select tree of *U. carpinifolia*.

Tree with upright narrow crown. Named for the 16th century botanist Christoffel Plantijn, and the cultivar name is sometimes spelled 'Plantijn'.

REBONE - See under "North American Hybrids and Selections."

RECERTA - See under "North American Hybrids and Selections."

REPERTA - See under "*U. japonica*."

REPURA - See under "North American Hybrids and Selections."

RESISTA - See under "North American Hybrids and Selections."

REVERA - See under "North American Hybrids and Selections."

REVERTI - See under "North American Hybrids and Selections."

SILVER GEM (Byland Bros. Ltd., Boskoop, Netherlands, Cat. 1974-1975, p. 72) - "novelty, fine branched bush with variegated silvery foliage." Listed under *U. carpinifolia*. Name not validated because of unresolved species assignment. See SILVERY GEM.

SILVERY GEM (Hilliers' Manual of Trees and Shrubs, 1972, p. 401) - "leaves with irregular but conspicuous creamy-white margin." Listed under *U. procera*. Name not validated because of unresolved species assignment. See SILVER GEM.

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