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Diseases of North American Forest Trees Planted Abroad

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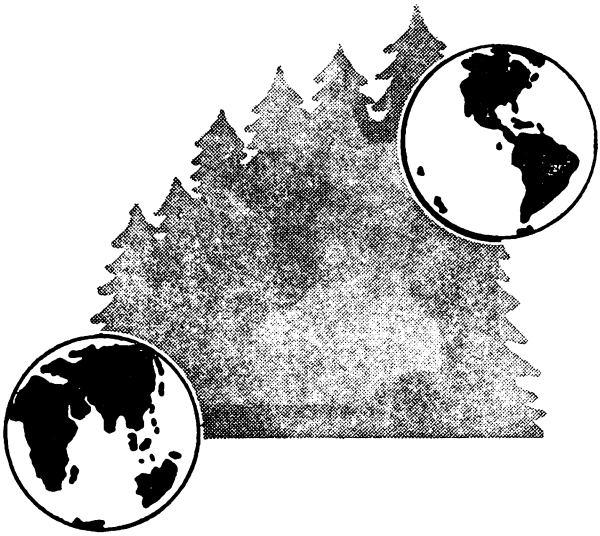
Diseases of North American Forest Trees Planted Abroad

An Annotated List



by **Perley Spaulding,**

formerly forest pathologist

Northeastern Forest Experiment Station

Forest Service

Agriculture Handbook No. 100 **June 1956**

U. S. DEPARTMENT OF AGRICULTURE

ACKNOWLEDGMENTS

In this work John A. Stevenson's "Foreign Plant Diseases" (U. S. Dept. Agr. unnumbered publication, 198 pp., 1926) has served as a reliable guide. Information on the occurrence of tree diseases in this country has been obtained from the "Index of Plant Diseases in the United States," by Freeman Weiss and Muriel J. O'Brien (U. S. Dept. Agr. Plant Dis. Survey Spec. Pub. 1, Parts I–V, 1263 pp., 1950–53). These two publications have been indispensable.

The author wishes to express his appreciation to Dean George A. Garratt for providing free access to the library of the School of Forestry, Yale University.

The common names and authorities for the Latin names of the trees, shrubs, and woody vines were supplied by W. A. Dayton. His assistance is very much appreciated.

Acknowledgment is also made to Bertha Mohr, who checked the data presented in this handbook. She is to be commended for her competent handling of an intricate job involving many strange technical names and for detecting errors and discrepancies.

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1956

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 45 cents

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Diseases of North American Forest Trees Planted Abroad[1]

INTRODUCTION

Diseases of forest trees may be briefly defined as abnormal physiology caused by four types of factors, singly or in combination: (a) nonliving, usually referred to as nonparasitic or site factors; (b) animals, including insects and nematodes; (c) plants; and (d) viruses. This handbook and the two others to follow deal only with the diseases attributable to plants and viruses as pathological factors.

Even though diseases caused by nonliving factors are not included, it must be clearly understood that low vigor of trees, not only resulting from adverse site factors but also induced by defoliation, can be disastrous because of susceptibility to severe attacks by semipathogens. Particularly is this true of planted and exotic trees. Diseases of slight importance on naturally regenerated trees in their native range are often serious to trees on unsuitable sites and may be destructive to exotics. Conversely, obligate parasites tend to attack the most vigorous host trees and leave subnormal ones unscathed. Since subnormal vigor may decrease the danger from obligate parasites, it may increase danger from semiparasites. Although growth vigor of exotics is desirable, it is no guarantee that an exotic will not be attacked if planted extensively.

The pests that cause tree diseases do not confine their activities to international boundaries. Many diseases have been introduced into North America from abroad; for example, white pine blister rust, larch canker, and Ceratostomella disease of elms from Europe; and the chestnut bark disease from China. These introductions into this country and similar ones into many other countries make it essential to have readily available more information on forest tree diseases of all countries.

To this end a survey was made of the infectious forest tree diseases of the world. The causal agents include viruses, bacteria, fungi, and the higher plants known as mistletoes and dwarf mistletoes. Diseases of fruit and nut trees are not included unless the hosts are growing in a wild state. The term "trees" is used in the broad sense and includes trees, shrubs, and woody vines.

Robert Hartig, who is rightly called "the father of forest pathology," began his investigations about 1870; and, except for a few earlier publications that have been reviewed, this survey covers the period subsequent to that year.

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[1] The term "North American" as used in this publication includes the area of Alaska, Canada, and the United States.

The publications examined include numerous forestry and arboricultural journals, abstracting journals, reports by forestry organizations, numerous pathological and mycological articles, and some recent comprehensive annotated lists of the fungi of some foreign countries.

The results of this survey will be published in three Agriculture Handbooks, of which two are to be issued later:

This publication lists the foreign plant pathogens that have been reported to attack North American trees abroad, indicates the seriousness of the attack, and includes a host list of these diseases. As an aid to future inquiries into their diseases, a list is also given of those plantings of North American trees that seem likely to be of interest. This list is in two parts: (a) general locations (p. 51), and (b) specific access points for those locations (p. 137).

To avoid much repetition, the authorities of the scientific names of the pathogens and the common names of the diseases are given in the list of diseases and nowhere else. In the same manner, the authorities of scientific tree names and their common names are given in the list of species planted abroad.

The second publication will list the North American plant pathogens that are known to attack foreign tree species growing in the United States.

The third will list the foreign infectious tree diseases with some indication of the damage they do, and the potential menace to North American forests of those diseases not known here.

More than 3,000 articles and books are included in the bibliography compiled for this survey. This bibliography is too large to publish as part of this handbook but is available for reference on index cards filed at the Forest Insect and Disease Laboratory, Northeastern Forest Experiment Station, New Haven, Conn.

THE DISEASES

This section lists the diseases known to attack North American trees in foreign countries. Included are diseases already present in North America, as well as those not known to occur here and which are indicated by an asterisk (*) preceding the scientific name of the pathogen.

This name includes the authority for the name, followed by (x), (xx), or (xxx), indicating the class of parasitism of the pathogen. It is believed important to point out this feature as foretelling possible action of the pathogens if, and when, they should arrive in this country. Accordingly, three classes have been set up.

The first (x) class causes disease occasionally and includes semi-pathogens that normally live saprophytically but under suboptimum conditions for the tree, or under especially favorable conditions for the organism.

The second (xx) class includes wound parasites that can attack trees only through wounds that expose the inner tissues. Nearly all decays of living trees and a considerable number of other diseases are of this type. Many wound parasites can live saprophytically.

Class three (xxx) pathogens are aggressive parasites, able to attack healthy trees. In fact many pathogens, such as the white pine blister rust fungus, attack the most vigorous and thrifty trees, whereas the suppressed individuals escape.

Fungi are living organisms and exhibit individuality. Moreover, of late years it has been found that many fungus species have numerous races, sometimes varying in pathogenicity. Parasites that are widely and generally distributed in other countries may have especially aggressive races that are not yet in the United States. For example, the black stem rust of wheat has been found to have hundreds of races varying in pathogenicity *and to be developing new races.* Such action is to be expected of tree-inhabiting fungi, such as *Armillaria mellea* with its worldwide range and recognized varieties. Although this fungus is common in our forests, its introduction on nursery trees, wood, or in soil from overseas might materially increase the root-rot problem for some of our tree species. This same fact is undoubtedly true, though probably to a lesser extent, for other pathogens native both here and on other continents.

Diseases caused by algae and lichens are not included because they are few and relatively unimportant.

Diseases of holarctic trees are included as diseases of North American trees although they usually occur on their hosts around the globe. Also included are diseases of herbaceous alternate hosts of forest tree diseases, when the only record on a North American host is on that herbaceous host.

Wherever a common name for a disease is known, it is given; the above-mentioned symbols for parasitism follow. Synonyms of Latin tree and fungus names are not given, the name used being that believed to be generally accepted or most common.

Where possible, specific locations of North American trees on which a disease has been reported are indicated by numbers in parentheses and the locality, following the name of each country. The numbers refer to places listed under "Locations of Foreign Plantings" (p. 137). The use of these numbers is rather infrequent, mainly because, in reporting the diseases encountered, the authors generalized to such an extent that in many places only the names of the countries where they were found were given. The list of "Locations of Foreign Plantings" is primarily for use with "Species Planted Abroad" (p. 51).

Diseases are segregated into four groups according to the type of causal agent and listed alphabetically:

Viruses, by common names.
Bacteria, by Latin names.
Fungi, by Latin names.
Mistletoes, by Latin names.

Each disease is annotated with the available data on life history, severity, and general distribution.

Viruses

Virus diseases have been known the world over for many years, but their cause has become known only within a few decades. Economic crops have received the most study. Some forest tree viruses are well known and there are, undoubtedly, numerous undiscovered viruses that will be found when more intensive studies can be made.

***Virus, Mosaic** (xxx) **maple mosaic**

The mosaic virus diseases are indicated by the following leaf abnormalities, singly or in combination: yellow mottling, vein etching, ring spot, leaf curling, reduction in size, and abnormal form. Severe attacks may cause leaves, branches, and even entire trees to die.

Acer negundo: Bulgaria, Czechoslovakia.

***Virus, Mosaic** (xxx) **poplar mosaic**

See account of symptoms under maple mosaic. Poplar mosaic is reported in Bulgaria, Czechoslovakia, and Yugoslavia.

Populus balsamifera: Bulgaria.

Virus, Witches' broom (xxx) **black locust witches' broom**

A witches' broom disease of black locust in the United States was found to be caused by a virus in 1933. The witches' brooms have been known in various places in this country for many years. Since 1933 it has been reported in Europe, where black locust is very widely distributed in France and Bulgaria.

Robinia pseudoacacia: Bulgaria; France (La Boulaye, Saone-et-Loire).

Bacteria

Pseudomonas berberidis (Thornberry & Anderson) Stapp (xxx) **barberry bacterial blight**

Appears as watersoaked spots on leaves, petioles, and shoots, and dieback follows. Occurs in the United States and Denmark.

Berberis canadensis: Denmark.

***Pseudomonas syringae** Van Hall f. **populea** Sabet & Dowson (xx) **poplar bacterial canker**

Cankers develop as local swellings on pale colored bark; a slimy exudate oozes from cracks or lenticels and drys to a slimy layer. Young branches are killed. On older parts the cankers become swollen and form irregular callus. Small red stripes develop in the wood. The disease develops rapidly in the spring and later becomes quiescent. Present in most poplar-growing countries of Europe; not known on poplar in the United States.

Populus trichocarpa: British Isles.

***Xanthomonas acernea** (Ogawa) Burkh. (x) **maple bacteriosis**

A bacterial disease of maple causing watersoaked spots on leaves, resulting defoliation, and drooping of young shoots is described in Japan. A slightly different organism causing maple leaf spot has been reported from California. There seems to be uncertainty about the identity of the two.

Acer negundo: Japan.
Acer saccharinum: Japan.

Xanthomonas juglandis (Pierce) Dowson (xxx) **walnut blight**

Black spot on leaves, shoots, and green nuts of *Juglans* spp., causes chief losses in the nut crop. Occurs on the Pacific Coast, British Columbia, eastern United States, Mexico, West Indies, Chile, Europe, Iran, South Africa, New Zealand, Tasmania, and Australia.

Juglans hindsii: France.

Fungi

Acanthostigma parasiticum (Hart.) Sacc. (xxx) **conifer needle blight**

The dead needles hang by mycelial threads and are overgrown beneath by a white coating. This blight is common locally on spruce in Germany and Bornholm Island on natural reproduction and even on 100-year stands on Bornholm. It occurs on spruces and has been found on *Tsuga canadensis*. A single occurrence on *Abies balsamea* in Nova Scotia is the only one known in North America.

Tsuga canadensis: Germany (9).

Aleurodiscus amorphus (Pers. ex Fr.) Rabenh. (x) **pink disk canker**

Dying of bark on stems of young suppressed *Abies* and occasionally of other conifers. Small pink disks up to 0.25 inch across grow attached to the dead bark. These disks are the fungus fruiting bodies. The disease is known in Europe and North America and apparently is native on both continents. Is usually a saprophyte but occasionally can become actively parasitic. Damage is not very important.

Pseudotsuga menziesii: Poland (14).

Armillaria mellea Vahl ex Fr. (x) **shoestring root rot**

Distributed almost everywhere in the world where trees grow. Is reputed to have caused heavy damage in many countries on diverse

tree species. Hundreds of articles have been published in forestry journals describing attack of this fungus and attempting to explain its often contradictory behavior under similar conditions.

In early years the general opinion was that this disease was caused by a virulent parasite able to attack vigorous trees and kill them in but a few years. More recently, numerous investigations by foresters and forest pathologists have shown that site conditions adverse to the growth of apparently healthy trees have preceded attacks of the fungus. In other words, the fungus is not the primary factor in the disease, and it might not have appeared at all if the tree had not become temporarily slowed down in its most vigorous growth.

The fungus is present in every tree stand, ready and able to attack under those conditions. If not thus attacked, the tree usually would recover but is unable to survive under the additional handicap of some roots killed by *Armillaria mellea*. The result is that the fungus is found on the dying tree and often is believed to be the primary factor in its death, whereas the fungus merely gives the death blow to a tree struggling to recover from an earlier severe injury due to drought, insect defoliation, or unsuitable soil. To avoid trouble the forester must handle his trees so as to keep them growing vigorously. Petch has reported that the so-called *A. mellea* as reported in Ceylon, Java, and West Africa really is *A. fuscipes* Petch.

Armillaria mellea varies much in appearance and aggressiveness in different forest trees. Numerous varieties have been described by mycologists; it is likely that truly parasitic (pathogenic) strains exist within its tremendous worldwide range. Many fungi are known to have strains or races, varying from true parasites to saprophytes unable to become parasitic under any condition.

Abies lasiocarpa: Germany (104).
A. procera: British Isles (general).
Chamaecyparis lawsoniana: British Isles (general); Germany (38, 44, 83); New Zealand (3).
C. thyoides: Germany (44, 104).
Libocedrus decurrens: Germany (104).
Parthenocissus quinquefolia: Netherlands (7).
Picea engelmannii: Germany (38).
P. pungens: Germany (38).
P. sitchensis: British Isles (46, 99); Denmark (Lundbygaard, Sydsjaelland); Germany (38).
Pinus banksiana: Germany (9).
P. contorta: Germany; New Zealand (3).
P. elliottii: Mauritius; Nyasaland; South Africa.
P. jeffreyi: Germany (104).
P. monticola: Germany.
P. ponderosa: New Zealand (3).
P. radiata: New Zealand (forests, general).
P. rigida: British Isles; Germany (9).
P. strobus: Belgium; British Isles (15, 115); Czechoslovakia (1); Germany (4, 5, 9, 29, 39, 44); New Zealand (3); Poland (3); Switzerland (1, 3, 6, 7, 9, 12, 13, 15, 17, 19, 20).
P. taeda: Mauritius.
Pseudotsuga menziesii: British Isles (general); Denmark; France; Germany (9).

Sequoia gigantea: Belgium.
Thuja occidentalis: British Isles (15); Finland; Germany (104); Sweden.
T. plicata: British Isles (Forest of Dean, near Monmouth); Germany (104); Poland (Pomorze, Wirty State Forest).
Tsuga heterophylla: British Isles.

***Ascochyta cladrastidis** Kab., & Bub. (xxx) **leaf spot**

Leaf spot; small, rounded, reddish brown with yellowish margin in Bohemia.
Cladrastis lutea: Czechoslovakia (1).

***Ascochyta diervillae** Kab. & Bub. (xxx) **leaf spot**

Rounded to irregular brown leaf spot in Bohemia.
Diervilla lonicera: Czechoslovakia (1).

***Ascochyta pteleae** Bub. & Kab. (xxx) **leaf spot**

Leaf spot in Bohemia.
Ptelea trifoliata: Czechoslovakia (1).

***Ascochyta robiniae** Sacc. & Speg. (xxx) **leaf spot**

Grayish leaf spot in Italy.
Robinia pseudoacacia: Italy.

***Ascochyta vulgaris** Kab. & Bub. var. **symphoricarpi** Grove (xxx) **leaf spot**

Leaf spot at Kew.
Symphoricarpus racemosus: British Isles (74).

***Ascochyta zimmermanni hugonis** Bub. (xxx) **leaf spot**

Leaf spot in Moravia.
Osmaronia cerasiformis: Czechoslovakia (Eisgrub).

***Ascochytula symphoricarpi** Died. (xxx) **stem canker**

Stem canker in British Isles.
Symphoricarpus racemosus: British Isles (74).

***Botryodiplodia rhois** Sacc. & Petr. (xxx) **dieback**

Dieback in Moravia.
Rhus typhina: Czechoslovakia (Weisskirchen).

Botrytis cinerea Pers. ex Fr. (xx) **gray mold blight**

May attack the current season's growth of many trees, both conifers and broadleaf, in early youth. The fungus is favored by high humidity and often is associated with damping-off. There appear to be numerous races of the fungus, ranging from aggressive parasites to innocuous saprophytes. The blight is distributed practically over the world except the Arctic and Antarctic regions.
Aesculus parviflora: Germany.
A. pavia: British Isles (74).
Cupressus macrocarpa: New Zealand.
Pinus radiata: New Zealand.
Prunus besseyi: British Isles.

Pseudotsuga menziesii: Belgium; British Isles; Denmark; France; Germany (104).
Thuja plicata: New Zealand.

Cenangium abietis (Pers. ex Fr.) Rehm (x) **dieback of pines**

Usually saprophytic but occasionally becomes parasitic on pines severely injured by drought or excess water. Appears as dieback on tree branches more than 5 years old. Twigs wither in spring. Insect injury may induce attacks also.
Pinus attenuata: Germany (29).
P. contorta: Norway (Fana).
P. rigida: Germany; Poland (3).
P. strobus: Germany (83); Poland (3).

Ceratostomella pilifera (Fr.) Wint. (xx) **bluing of sapwood**

Bluing of the sapwood of living trees leads to death of those affected by interrupting water conduction.
Pinus radiata: New Zealand; South Africa (3).

Ceratostomella ulmi Buis. (xxx) **Ceratostomella disease of elm**

This elm disease was found first in the United States at two points in Ohio in 1930, and in New Jersey in 1933. It came to this country on elm burl logs imported from Europe for veneer manufacture. In Europe the disease was noted first in 1918; it has spread over Europe eastward to Russia and the Balkans. All American and European elms are susceptible. Resistance of some Asiatic elms has led to the supposition that the disease came to Europe from Asia in World War I. It has extended in this country from Indiana, Kentucky, and Tennessee eastward to the Atlantic Coast. An extensive outbreak is in the Province of Quebec. Symptoms of the disease are yellowing or wilting of leaves on one or more branches; others are then attacked until the tree is dead. The sapwood shows brown spots or annual rings. Other elm diseases affect the trees in much the same way; so it is necessary to culture and identify the fungus to be certain of identification. Selection of resistant trees for propagation and cross-breeding resistant elm species with our American elm appear to promise means of control.
Ulmus americana: Belgium; Italy; Netherlands; Romania.

***Chrysomyxa abietis** (Wallr.) Ung. (xxx)
spruce needle cushion rust

Autoecious, overwintering in infected needles of the previous year, fruiting in the spring after infection, and infecting the current year's needles. Attacks the young leaves of *Picea* spp. from northern Scandinavia and western Russia southward; causes partial defoliation in severe outbreaks. Usually this rust is not considered very damaging, but occurrences are reported of extensive defoliation. Introduced at Louisville, Ky., in 1907, on imported nursery stock of *Picea abies* from Denmark. Not known to have become established here.
Picea engelmannii: Denmark (3); Norway (Nannestad, Tømte, Holla, Nord-Rana).
P. glauca: Norway (Time).

P. pungens: Denmark; (3) Germany; Norway (Nord-Rana).
P. rubens: British Isles (Argyllshire or Newcastleton Forest).
P. sitchensis: British Isles; Norway (Hoyland, Sandved).

Chrysomyxa cassandrae (Peck & Clint.) Tranz. (xxx) **Chamaedaphne-spruce needle rust**

Holarctic. Heteroecious, accompanying *Chamaedaphne* and spruces around the world in the North Temperate Zone. Overwinters on *Chamaedaphne* leaves. Forms yellow rust pustules on the lower side of spruce needles in great quantities and orange pustules on the lower surface of *Chamaedaphne* leaves. Rusted spruce needles are shed prematurely and some damage can be caused in nurseries.

Chamaedaphne calyculata: Asia (1).

Chrysomyxa empetri (Pers.) Schroet. (xxx) **Empetrum-spruce needle rust**

Holarctic. Heteroecious, accompanying *Empetrum* and spruces over northern Europe, northern Asia, and northern North America. This disease forms yellow rust pustules on all sides of the spruce needles and the upper side of *Empetrum* leaves. Overwinters on *Empetrum* leaves.

Empetrum nigrum: Norway (3).

Chrysomyxa ledi (Alb. & Schw.) d By. var. **rhododendri** (DC.) Savile (xxx) **Rhododendron-spruce needle rust**

Heteroecious. Distributed in alpine regions of Europe, Siberia, Japan, and China. Reported in Canada from Newfoundland to northern British Columbia on wild *Rhododendron lapponicum* (L.) Wahl. and in the State of Washington on cultivated rhododendrons. On *Rhododendron* the rust overwinters in a dormant state within the leaves. In the spring small, dark red cushions appear on the lower side of the leaves and set free tiny spores, which infect needles of spruces in the vicinity. In late summer yellow zones appear on the infected needles; then irregular, white, toothlike projections form in a single series along the inner side of each needle. They set free yellow spores that infect *Rhododendron* leaves and new shoots, and start the cycle over again. Diseased needles die and fall, so that spruces heavily attacked may be almost entirely leafless and may suffer considerable damage. Entire forests of spruce may be thus attacked. This disease has threatening possibilities for our spruces if it becomes established south of its native range.

Picea pungens: Germany.

Chrysomyxa pyrolae (DC.) Rostr. (xxx) **Pyrola-spruce cone rust**

Holarctic. Reports of this disease mention the American species of *Pyrola* but no American spruce. Hence the listing of these native herbs.

Heteroecious, accompanying *Pyrola* and spruce from Greenland to Alaska, south to Maryland, New Mexico, and California; also Europe, Siberia, Kamchatka, Japan, China, and India. The rust forms yellow, powdery, large pustules, mostly on the outer side of the green cone scales on spruces. On *Pyrola* the rust forms large, orange, powdery pustules or reddish, waxy cushions on the lower side of the

leaves. Overwinters on *Pyrola* leaves. Seeds of infected cones are aborted by the rust appropriating much of the food material. Damage is unimportant as many cones usually remain free of the rust.

Pyrola minor: Asia (1); Norway (3).
P. rotundifolia: Norway (3).
P. rotundifolia americana: Norway.
P. secunda: Asia (1); Norway (3).

***Chrysomyxa woronini** Tranz. (xxx) **Ledum-spruce stunted shoot rust**

Heteroecious. On *Picea abies* this rust causes deformed, shortened, conelike shoots with short, broad needles of a pale color. The rust forms linear cushions on either side of the midrib. The rust is reported to have *Ledum* as its alternate host. Has been found in northern and middle Sweden, northeast Norway, Finland, adjacent areas of northwest Russia southward to the Neva River, northern Estonia, Siberia, and Kamchatka. Reported once on nursery plants of Douglas-fir in Scotland, but report appears doubtful. Is not considered very damaging.

Pseudotsuga menziesii: British Isles (Scotland).

***Ciborinia candolleana** (Lév.) Whetzel (xxx) **oak leaf blotch**

A brown blotch of oak leaves. Causes general infection over the entire trees and defoliation in heavy attacks. Even nursery plants are infected. Chestnut is also attacked. The disease is known in Great Britain, Denmark, France, and Germany.

Quercus rubra: British Isles.

Coleosporium campanulae (Pers.) Lév. (xxx) **bluebell-pine needle rust**

Holarctic. Heteroecious. Forms numerous small, orange, powdery pustules in summer followed by red cushions, both on the lower leaf surface of bluebell. In spring, infection of needles of hard pines leads to formation on the lower surface of a series of flattened white tubes about ½ inch long, projecting at right angles. Powdery yellow spores are set free by breakage of the tips and start a new cycle by infecting bluebell leaves in the vicinity. Damage is slight, as only heavily diseased needles are cast prematurely. This rust is widely distributed from New Hampshire to Wisconsin, south to the Gulf of Mexico, and in central California; also generally in Europe and Asia.

Campanula rotundifolia: Norway (3).

***Colletotrichum magnoliae** Camara (xxx) **leaf spot**

Magnolia grandiflora: Portugal (3).

***Colletotrichum mahoniae** Fabricatore (xxx) **leaf spot**

Small, gray, rounded leaf spot.

Mahonia aquifolium: Italy (Rome).

***Coniophora bourdotii** Bres. (x) **butt rot**

Psuedotsuga menziesii: British Isles.

Coniophora puteana (Schun. ex Fr.) Karst. (xx) **butt rot**

Sequoia gigantea: British Isles (Scotland, St. Andrews).

Corticium salmonicolor Berk. & Br. (xxx) **pink disease**

The pink disease attacks broadleaved trees and shrubs throughout the tropics of the world, especially where crops such as tea, coffee, Cinchona, cacao, and rubber are grown. Reported in North America, but doubtful. It appears as a pink coating on branches and leaves, which may be killed if heavily attacked. Entire trees of native species are often killed.

Cupressus macrocarpa: Kenya.

Coryneum cardinale Wagener (xx) **cypress canker**

Cypress canker and dieback occurs in western California on Monterey cypress and its varieties, *Cupressus lusitanica, Thuja orientalis, Chamaecyparis lawsoniana, Libocedrus decurrens,* and *Juniperus chinensis* var. *femina.* It is also reported on *Cupressus macrocarpa* on the North Island of New Zealand, in Kenya, Italy, and France. Cankers form at the forks of branches or where they join the trunk, and the distal end dies. Thus, scattered twigs and branches die back, finally killing the entire tree. The future of Monterey cypress in the United States is threatened because of the limited range of the tree and the presence of the disease well over that limited range.

Chamaecyparis lawsoniana: New Zealand.

Cupressus macrocarpa: France (59); Italy; Kenya; New Zealand (3).

Thuja plicata: New Zealand.

***Coryneum tiliaecolum** Ferr. & Lindegg (x) **canker**

Associated with bark cankers on branches.

Tilia americana: Italy (Piacenza).

***Cronartium kamtschaticum** Jørstad (xxx) **Castilleja cronartium**

Believed to be *Peridermium kurilense* Diet. on *Pinus pumila* with its alternate *Cronartium* stages on *Castilleja pallida* and *Pedicularis* spp. No inoculation experiments have been made to prove identity of the *Peridermium* and *Cronartium* stages.

Castilleja pallida: Asia (1).

***Cronartium quercuum** (Berk.) Miy. (xxx) **Asian pine-oak blister rust**

This rust greatly resembles our eastern pine gall rust, *Cronartium cerebrum* (Pk.) Hedgc. & Long. In fact, the two have been accepted as identical until recently when significant differences were found. Oaks are the principal alternate hosts, hard pines the coniferous hosts, of both species. *Cronartium quercuum* is known in China and Japan definitely. Probably in India, Siberia, Korea and Europe.

Quercus palustris: Japan.

Cronartium ribicola A. Fisch. (xxx) **blister rust**

This rust is known to have been in the United States as early as 1898. It came to us from Europe in young trees of *Pinus strobus,* was imported in large numbers from 1907 to 1910, and was planted

in widely scattered localities in the northern States westward to Minnesota. A single shipment of 1,000 infected transplants went directly from France to Vancouver, B. C., in 1910. The blister rust has spread over the entire range of *Pinus monticola*, into northern California on *P. lambertiana*, on *P. flexilis* in Montana, and is common on *P. albicaulis* near timberline in the Pacific Northwest and British Columbia.

The original home of this blister rust is believed to be eastern Siberia, from whence it was carried to Europe about 100 years ago. Thus, it has traversed the North Temperate Zone around the world. This disease requires alternate *Ribes* hosts to complete its life cycle. As the fungus cannot spread directly from pine to pine, removal of the *Ribes* to a sufficient distance from valuable white pine stands will control attacks. At heavy expense, justified by the high value of lumber, a catastrophe like that of the chestnut blight can be, and is being, avoided.

Pinus albicaulis: British Isles (97); Sweden (Harnosand).
P. aristata: British Isles (97).
P. balfouriana: Belgium (17); Germany (104).
P. flexilis: Belgium (9, 17, 35); British Isles (Scotland); Denmark (3); France (6); Germany (44, Aschaffenberg); Lithuania (Kaunas Botanical Garden); Norway (Bergen, Fjosanger, Söfteland); Sweden (1, 3, 4, 5).
P. lambertiana: Belgium (9, 17, 35); British Isles (92, 97); France (2, 6); Germany (44, Bremen).
P. monticola: Belgium (9, 38); British Isles (10, 92, 97); Denmark (5); Finland (2); Germany (104, 109, 115); Sweden (Harnosand).
P. strobus: Belgium (6, 12, 14, 32); British Isles (15, 70, 86, and Ireland); Czechoslovakia; Denmark; Estonia (1); Finland (2, 4); France; Germany (4, 9, 56, 72, 74, 94, 100, Black Forest, Saxony, Schorndorf); Latvia (1); Lithuania; Norway (3); Poland (3, 10, 14); Russia (4, 5); Sweden; Switzerland (1, 3, 6, 7, 9, 12, 13, 15, 17, 19, 20).
Ribes americanum: Belgium.
R. odoratum: Belgium; Denmark; France; Norway; Switzerland.
R. sanguineum: Belgium; British Isles (Scotland); Denmark (Falster, Stubbekobing); France; Norway; Switzerland (21).

***Crumenula pinicola** (Rehm) Karst. (xx) **pine dieback**

Causes bark wounds on trunks and branches and kills entire trees in Norway.

Pinus contorta: Norway (Nord-Rana, Revelen near Mo).
P. strobus: Denmark; Norway.

***Crumenula sororia** Karst. (xx) **pine pitch canker**

A small cuplike fungus causing pine bark cankers with exuding pitch. An active wound parasite. Reported damaging in Finland, Denmark, and Netherlands.

Pinus contorta: Finland (Urjala, near Lake Nuutajärvi).

***Cucurbitaria piceae** Borthwick (xx) **spruce bud blight**

Bud blight of blue spruce is reported in Germany and Switzerland causing considerable damage. Several years may elapse before

affected trees show definite symptoms. The buds are swollen at first and then die, and the new growth is suppressed. As a result the tree develops a stunted appearance. The mycelium perennates in the tissues.

Picea pungens: Germany; Switzerland.

Cucurbitaria pithyophila (Fr.) de N. (xx) **bark canker**

Rough bark cankers with granules buried in the fissures. Extension of the canker around the infected part girdles it, and kills the upper part. Reported on *Abies*, *Pinus*, and *Picea* in Europe and Japan. Reported in the United States as a saprophyte.

Abies procera: Germany.
Picea pungens: Germany.
Pinus strobus: Denmark; Germany.

Cumminsiella sanguinea (Peck) Arth. (xxx) **Mahonia rust**

Autoecious. Native in North America. First reported in Europe in 1922, in Scotland; it had spread well over Europe by 1930. Forms brownish powdery pustules and brown cushionlike spore masses on the lower leaf surface.

Mahonia aquifolium: Norway (3), general in southern Norway.

Cytospora chrysosperma Fr. (xx) **poplar and willow canker**

This canker occurs on woody parts, from twigs to large trunks, as rounded, deadened areas of bark. Sprouts often develop just below the canker. Yellow to reddish spore tendrils form on the dead bark. Infection starts in some injury or on dead twigs. The imperfect *Cytospora* stage is most common on partly living, diseased trees; but there is an ascogenous stage, *Valsa sordida* Nits. This develops later and not as commonly as the *Cytospora*. Trees weakened by drought are especially liable to attack. Once entry to the tree is established, *Cytospora* becomes parasitic and may penetrate practically the entire trunk and branches. This disease is reported from North America, south to Mexico, Argentina, Australia, and Europe.

Populus balsamifera: British Isles (general).
P. deltoides: Germany.

Daedalea unicolor Bull. ex Fr. (xx) **trunk rot**

A gray to white, small, shelf fungus with irregularly shaped pores beneath, often splitting into teeth. This trunk rot usually grows on living and dead broadleaved trees, in overlapping groups, and causes a white heart rot in living trees. Unlike most heart rot fungi, it progresses rather rapidly within the infected tree and encroaches on the sapwood until the tree is killed or broken over by wind. It is common as a saprophyte but readily makes entry to living trees through dead companion sprouts, broken branches, and fire scars. It ranges in Canada and the United States wherever broadleaved forests grow, is reported pathogenic on maple and black locust in Hungary and Italy, and is probably generally distributed in Europe, India, Siberia, Japan, and Anglo-Egyptian Sudan.

Acer rubrum: Hungary; Italy (2).
A. saccharinum: Hungary.
Robinia pseudoacacia: Hungary.

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Dasyscypha calyciformis Willd. ex Rehm (x) **fir canker**

A small cup fungus, pure yellow inside, on conifers (mostly *Abies*), commonly saprophytic, but occasionally parasitic. European in distribution. Reported in United States, but apparently questionable.

Abies balsamea: Norway (Aas, East Aker, Trondheim).
A. concolor: Norway.
A. fraseri: Norway.
A. grandis: Norway (Rogaland).
Picea sitchensis: Denmark (Palsgaard).
Pinus contorta: Denmark.

Dasyscypha pini (Brunch.) Hahn & Ayers (xxx) **pine canker**

A large cup fungus up to 1 inch or more in diameter, often crowded on cankers caused by it. Fruits on the dead bark of cankers, but not on dead stems beyond the cankers. Disk orange-yellow (not reddish) within, with pale cinnamon hairs externally. Parasitic on pines at high altitudes and northern latitudes in Europe and North America from upper Michigan to Montana, Washington, and British Columbia. Evidently native to both continents.

Pinus contorta: Norway.

Dasyscypha resinaria (Cke. & Phill.) Rehm (xxx) **conifer canker**

A small cup fungus up to about ½ inch across, with pale orange disk inside; grows on pitchy cankers of pines, spruces, firs, and Douglas-fir in Europe and North America.

Pinus contorta: Norway.
Pseudotsuga menziesii: Norway.

***Dasyscypha subtilissima** (Cke.) Sacc. (xxx) **pine canker**

A small cup fungus growing on blackened, sunken pitchy cankers of pines in northern Europe.

Pinus contorta: Finland; Norway.
P. strobus: Norway.

Diaporthe oncostoma (Duby) Fckl. (xx) **black locust dieback**

Appears as small cankers on branches, resulting in dieback in the United States and Europe.

Robinia pseudoacacia: France.

Didymascella thujina (Durand) Maire (xxx) **cedar leaf blight**

A small, round, brown to black, cushionlike fungus embedded usually in the upper leaf surface. This fungus causes shedding of affected leaves especially near the ground where moisture is high. Small trees are often killed; older ones may be generally infected but are not so seriously affected. Nursery trees have been seriously attacked in Europe but can be protected by applications of fungicides, whereas older stands cannot now be so treated. Leaf blight is largely a disease of *Thuja plicata* but is known also on *T. occidentalis* in North America. Evidently it has been carried to Europe on seeds. It is known in western Europe and New Zealand.

Thuja occidentalis: Belgium; British Isles (general).
T. plicata: Belgium; British Isles (widely distributed; severe in Ireland); Denmark; Netherlands; New Zealand.

Didymascella tsugae (Farl.) Maire (xxx) **hemlock leaf blight**

Hemlock (*Tsuga canadensis*) is subject to a leaf blight similar to that of cedars. The fungus is minute, cushionlike, dark brown, embedded in the lower leaf surface on either side of the midrib, and bursting the overlying epidermis. It occurs on green and dead leaves of lower, shaded branches, but occasionally on upper branches. The diseased leaves soon fall and leave heavily infected trees with a noticeably thin appearance. The blight is known from New England, New York, North Carolina, Wisconsin, and Alaska. It apparently was carried to Scotland shortly before 1937, when it was first discovered there.

Tsuga canadensis: British Isles (Scotland).

***Diplodia acicola** Sacc. (x) **needle blight**

Small, dark pustules on needles of several hard pines in Spain and Portugal. Associated with other fungi in a general dying of stands over considerable areas.

Pinus radiata: Portugal; Spain (1).

Diplodia natalensis P. Evans (xx) **needle blight**

Reported on various hardwood and coniferous trees in North America, South Africa, and China. Leaves of hard pines turn bronze green in watersoaked areas in Australia. Old leaves are affected first. Diseased trees die in about 6 weeks. First infections are on the side of the tree sheltered from sun and wind.

Pinus elliottii: Australia (6).
P. taeda: Australia (6).

Diplodia pinea (Desm.) Kickx. (xxx) **leaf and twig blight**

Leaf and twig blight of conifers; also a serious sap stain of lumber. Serious on exotics, especially in New Zealand, Australia, and South Africa. Appears to have been carried wherever extensive forest planting has been done. In North and South America, Europe, Asia, Africa, and Australia. Saprophytic on wood and aggressively parasitic on wounded living trees. Can infect unwounded trees but usually not so seriously.

Chamaecyparis lawsoniana: New Zealand.
Pinus contorta: New Zealand.
P. coulteri: Australia.
P. elliottii: Argentina (1); Australia; Mauritius; South Africa (4).
P. muricata: New Zeland.
P. palustris: South Africa (4).
P. ponderosa: Australia (1); New Zealand.
P. radiata: Argentina (1); Australia (1); New Zealand; South Africa (1, 4).
P. sabiniana: France (near Paris).
P. strobus: British Isles.
P. taeda: South Africa (4).
Pseudotsuga menziesii: New Zealand.

Diplodina parasitica (Hart.) Prill. (xxx) **spring dieback**

Dieback of spruce leaders and branches, and blight of young seedlings. Resembles frost injury. In Europe from the British Isles

eastward through Belgium, France, and Germany to Russia. Reported from Maine and North Carolina. Severe attacks have damaged pole stands in Europe. Nursery beds may be much injured.

Picea pungens: Norway (Ringebu).

P. sitchensis: British Isles (Aberdeenshire); Poland (3).

Dothichiza populea Sacc. & Briard (xx) **poplar canker**

Infections first appear as brown, rounded to elliptical spots in the bark of young stems, frequently with dead leaves or twigs at the center. The bark dies to the wood. Later, the bark bursts open by pressure of callus beneath the edges of dead tissue. Growth of the canker stops after the new wood layer forms and resumes the next spring. Cankers often girdle small branches, which then die. Water sprouts form below the girdle, but they are soon girdled in turn. In the spring pimples form on the dead areas and exude tendrils of tiny spores to start new infections. Their germ tubes can enter uninjured tissue, but injuries greatly favor rapid spread of the disease. It was known in Europe as early as 1884 and has spread well over Europe. Activity in breeding and propagating poplars has accelerated its progress from country to country over western Europe and in the Argentine, as well as Canada and the United States. It is limited to planted stands.

Populus balsamifera: Netherlands.

P. deltoides: Belgium; France; Italy; Netherlands.

P. fremontii: Netherlands.

P. fremontii var. *wislizenii:* Netherlands.

P. trichocarpa: Netherlands.

***Dothidea noxia** Ruhl. (xx) **oak branch canker**

Branch canker, starting in wounds and killing the distal end of the branch. Occurs in Germany. Serious locally. Also attacks chestnut and beech.

Castanea dentata: Germany (Saxony).

Quercus rubra: Germany (10, 104, Mecklenburg, Saxony).

***Erysiphe polygoni** DC. f. **robiniae hispidae** Nann. (xxx) **powdery mildew**

On leaves in Italy.

Robinia hispida: Italy.

***Excipula strobi** Fr. (xxx) ———

Parasitic on stems.

Pinus strobus: Denmark.

Fomes annosus (Fr.) Cke. (x) **root rot**

No shoestrings are formed. A thin filmy white mycelial tissue may form between the bark and wood. In advanced decay, small pockets containing white fibers form. Some pockets have a black spot in the middle of the white fibers.

Found throughout the North Temperate Zone usually on conifers but occasionally on hardwoods. Widely distributed in North America, but has not been considered serious until late years. Root rot is

appearing in plantations and will become more serious as young plantations increase in age.

In Europe root rot is considered to be a serious disease factor. Much study has been given it there. The general opinion is that adverse soil conditions for the trees control its development. The forests there are largely planted and have been for several generations, on the same areas. The soil has become depleted and is often not of optimum character for the species of tree planted. Losses are heavy. It is stated that "half of all Danish firs are destroyed by this fungus!" Thinning of infected stands has been found to increase the damage; stumps of healthy trees removed by thinning becoming promptly infected and serve as new centers of infection. Continued experiments in England indicate that newly cut stumps are infected, presumably by spores. Prompt painting of newly severed stumps brought about nearly complete absence of the disease one year later.

Abies balsamea: Denmark (Palsgaard plantage); Norway (Forde, Jelsa near Stavanger, Mo, Ostlandet, Rogaland, Sogn).
A. grandis: British Isles (general); Norway.
A. procera: British Isles; Denmark; Norway (Njaheiene, Rogaland, Time).
Chamaecyparis lawsoniana: British Isles.
Juniperus communis: Belgium.
Picea glauca: Denmark; Norway (Rogaland, Sogn).
P. pungens: Norway (Akershus).
P. sitchensis: British Isles (general); Denmark (11); Germany (94); Norway (Rogaland).
Pinus banksiana: Denmark
P. contorta: Denmark (general); Finland (present where grown); Norway (Akershus).
P. palustris: Denmark.
P. strobus: Belgium; British Isles; Czechoslovakia; Denmark; Germany (9); Switzerland (1, 3, 6, 7, 9, 12, 13, 15, 17, 19, 20).
Pseudotsuga menziesii: British Isles (7, Forest of Dean near Monmouth); Denmark; Norway (Rogaland).
Sequoia gigantea: British Isles (4).
S. sempervirens: British Isles.
Thuja occidentalis: Denmark.
T. plicata: British Isles (49).
Tsuga heterophylla: British Isles; Norway (Akershus, Hordaland).

Fomes applanatus (Pers. ex S. F. Gray) Gill. (xx)
white mottled rot

Apparently native well over the world in naturally wooded regions. Typical occurrence is in older trees in large trunk wounds caused by fire, falling trees, and large broken branches. This rot occurs on living broadleaved species and is destructive to hardwood and coniferous logs. Rot in the tree usually extends but a few feet from the point of entry. The conk is often called "artist's fungus," as the white lower surface, where scratched, turns dark brown.

Populus balsamifera: Norway.
P. deltoides: Denmark.

Fomes connatus (Weinm. ex Fr.) Gill. (xx) **white spongy rot**

A typical heart rot of hardwoods in the North Temperate Zone; also reported in South Africa. Obtains entry in large wounds near the butt of the tree caused by floating ice cakes, frost cracks, and large branches broken out of the trunk. The conk is perennial, white, usually less than 6 inches across, corky and often with moss growing on the rough upper side. The rot usually extends but a few feet from the point of entry.

Populus deltoides: Denmark; Norway.

Fomes fraxineus (Bull. ex Fr.) Cke. (xx) **soft, white heart rot**

A corky to rigid conk, light colored with reddish stains, usually near the bases of living hardwood trees. Widely and sparsely distributed in eastern Canada, eastern United States, and Europe; also reported from Japan. Damage is negligible because of very scattered distribution.

Robinia pseudoacacia: British Isles; Russia (3).

Fomes igniarius (L. ex Fr.) Kickx. (xx) **white heart rot**

White heart rot of hardwoods is practically worldwide; it is known on all continents and on a great number of broadleaved species. The conk is woody, brown to black, usually rough with numerous cracks and crevices on the upper side, grayish to brown beneath. This rot is variable in appearance and has developed an aspen form, a birch form, and a typical form on each of its other hosts. Entry to the tree trunk is usually through dead branches or other large injuries on the trunk. The decay is a white, spongy heart rot bounded by dark zones or lines. The damage caused is tremendous because most of the valuable hardwood timber species are attacked at about the time of commercial maturity.

Populus deltoides: Denmark; Norway.

Fomes pini (Brot. ex Fr.) Karst. (xx) **red ring rot**

Red ring rot caused by *F. pini* (formerly *Trametes pini*) occurs in coniferous forests throughout the North Temperate Zone. Nearly all conifers are susceptible. Entry to the tree trunk is through branches killed by shading, stubs of broken living branches, or wounds where living branches 2 inches or more in diameter are removed. The typical conk is brown throughout (nearly black with age on top), rough, and much cracked above and rather thick. A small variety grows as a small, flat, brown plate on the bark or lower side of a branch. The decay is a small white pocket-form with thin, nearly sound, wooden layers between adjacent pockets. The damage caused is well known and feared by foresters handling coniferous stands in all parts of the northern hemisphere.

Abies balsamea: Denmark.
Pinus strobus: Germany (29); Poland (14).
Pseudotsuga menziesii: Belgium.

Fomes robustus Karst. (xx) **white trunk rot**

White rot of heart and sapwood of conifers, hardwoods, and cacti is widely distributed in Alaska, Canada, and the United States; also in Europe, Asia, Australia, and South Africa. It is uncommon every-

where. Because of its sparse occurrence, damage caused is relatively light. Like the heart rots generally, entry to the tree trunk is through wounds.

Robinia pseudoacacia: South Australia.

***Fusarium herbarum** Cda. ex Fr. (x) **wilt, dieback**

The species of *Fusarium* are small, inconspicuous fungi that live in the soil as saprophytes, but some are aggressive parasites on roots of many plants and cause wilt of the upper parts by interrupting water conduction. They often cause damping-off of seedlings and inflict heavy damage. They occur everywhere that trees grow. High moisture of soil and air favors them. Wilt or dieback may be caused on stems and branches, and leaf spots appear on trees beyond the seedling stage. Here they form grayish or white, cottony wefts on the surface and small pustules exuding light-colored spore masses. They can be identified only with a misroscope.

Robina pseudoacacia: Germany.

Fusarium oxysporum Schlecht. amend Snyder & Hansen (xxx) **damping-off**

Damping-off of seedlings. See description under **F. herbarum.**

Pinus radiata: Argentina.

***Fusarium pseudacaciae** Rapaics (x) **wilt, dieback**

Stem infection. See description under **F. herbarum.**

Robinia pseudoacacia: Hungary (Debrecen).

Fusarium sambucinum var. **coeruleum** Wr. (x) **wilt, dieback**

Dieback of branches. See description under **F. herbarum.**

Robinia pseudoacacia: Germany.

***Fusarium vogelii** P. Henn. (xxx) **leaf spot**

Associated with leaf spot in Germany and Poland. See description under **F. herbarum.**

Robinia pseudoacacia: Germany (Tamsel); Poland (14).

***Fusicoccum mac-alpini** Sacc. (x) **brown leaf spot**

On living leaves in Australia.

Quercus coccinea: Australia (central part).

Fusoma parasiticum Tub. (xxx) **damping-off**

Damping-off of coniferous seedlings in northern Europe and also in United States. Causes heavy losses in seedbeds. See general description under **Fusarium herbarum.**

Abies balsamea: Germany (104).
A. concolor: Germany (104, Breslau).
A. procera: Germany (104).
Chamaecyparis lawsoniana: Germany (104).
Juniperus virginiana: Germany (104).
Libocedrus decurrens: Germany (104).
Picea engelmannii: Germany (104).
P. glauca: Germany (104).
P. pungens: Germany (104).
P. rubens: Germany (104).

P. sitchensis: Germany (104).
Pinus banksiana: Germany (104).
P. contorta: Germany (104).
P. ponderosa: Germany (104).
Pseudotsuga menziesii: Germany (104).
Thuja occidentalis: Germany (104).
T. plicata: Germany (104).
Tsuga canadensis: Germany (104).

Ganoderma sessile Murr. (xx) **stringy white rot**

A large, leathery to corky, shelflike conk with reddish, thin, "varnish" upper surface. At the base of various living hardwood trees, entering large basal wounds and causing a stringy white rot. Widely distributed in the temperate zones.
Robinia pseudoacacia: Argentina.

Gloeosporium acerinum West. (xxx) **maple leaf spot**

Leaf spot and twig blight of *Acer* spp. in Europe and the United States.
Acer negundo: British Isles.

Gloeosporium inconspicuum Cavara (xxx) **wilt**

On wilting leaves in Europe and United States.
Ulmus americana: Italy (Pavia).

***Gloeosporium microstromoides** Moesz (x) **gray seedpod spot**

Forms gray spots on seed pods.
Catalpa bignonioides: Hungary (Budapest).

Gloeosporium quercinum West. (xxx) **brown leaf spot**

Causes dead, shriveled, brown spots on the edges of curled leaves in Europe and North America.
Quercus alba: Germany.
Q. bicolor: Germany.
Q. coccinea: Netherlands.
Q. macrocarpa: Germany.
Q. prinus: Germany.
Q. rubra: Netherlands.
Q. stellata: Germany.

***Gloeosporium vagans** Syd. (xxx) **leaf spot**

Causes small, reddish-brown to purple-brown leaf spot.
Acer pensylvanicum: Germany (Tamsel).

***Gloeosporium variabilisporum** Kab. & Bub. (x) **leaf spot**

Causes confluent, marginal, tan to brown leaf spot.
Quercus rubra: Czechoslovakia (1, Gross-Skal).

***Gnomonia cerastis** (Riess.) **negundinis** Karak. (xxx) **leaf spot**

Acer negundo: Russia (9).

Gnomonia leptostyla (Fr.) Ces. & de N. (xxx) **Juglans leaf spot**

Affects all *Juglans* and some *Carya* species of North America, Europe, and Asia. The leaf spots are small, white to grayish yellow with brown edges, irregular, limited to interveinal areas on the lower leaf surface or on the young fruits. Heavily spotted leaves and fruits may fall prematurely. Continued attacks may weaken trees until they die.

Juglans californica: France.
J. cinerea: France.

Gnomonia veneta (Sacc. & Speg.) Kleb. (xxx)
Platanus defoliation, twig blight

Causes brown spots along the main leaf veins, on petioles, and on young twigs leading to premature leaf fall and twig blight. Distributed in North America and Europe and reported in Argentina.

Platanus occidentalis: British Isles (74, southern England and Midlands); Germany (Göttingen); Italy; Netherlands.

Gymnosporangium aurantiacum Chév. (xxx) **cedar rust**

Heteroecious. Causes elongated swollen stems on *Juniperus communis* and *J. communis* var. *saxatilis* and swollen, rounded spots, each with several small tubes containing light brown spores, on the lower leaf surface of *Sorbus* spp. in Europe and North America.

Juniperus communis: Norway.
Sorbus americana: Norway.

Gymnosporangium bermudianum (Farl.) Earle (xxx) **cedar apple**

Forms perennial globose stem galls.

Juniperus virginiana: Bermuda.

Gymnosporangium clavariaeforme (Jacq. ex Pers.) DC. (xxx)
cedar rust

Heteroecious. Forms slight swelling of stems of *Juniperus communis*. Has alternate stage on leaves and fruits of *Crataegus* and *Sorbus*, forming white upright tubes containing yellowish spores. These tubes spring from swollen, reddish leaf or fruit spots. In North America and Europe.

Sorbus americana: Norway.

Gymnosporangium juniperinum (L. ex Pers.) Mart. (xxx)
cedar rust

Heteroecious. Forms hemispheric swellings on stems and twigs of *Juniperus communis* and *J. communis* var. *saxatilis*, and on thickened spots on the lower leaf surface of *Sorbus* spp. Each spot bears several small tubes containing chestnut-brown spores. Native in Europe and the Rocky Mountains from Colorado to Alberta and British Columbia.

Crataegus succulenta: Norway (southern).

***Gymnosporangium mespili** (DC.) Kern (xxx) **cedar rust**

Heteroecious. Causes slight stem swelling on *Juniperus sabina*, *J. phoenicea*. and *J. virginiana*. Alternate hosts are species of *Crataegus*.

Cotoneaster, and *Mespilus*. Thickened, roundish spots bear slender tubes containing the spores. Distributed in Europe, Siberia, Kashmir, and India.

Juniperus virginiana: Denmark (Dalum, Horsens).

***Gymnosporangium sabinae** Dicks. ex Wint. (xxx) **cedar rust**

Heteroecious. Causes swelling of stems of *Juniperus sabina, J. oxycedrus, J. phoenicea*, and *J. virginiana*. On leaves of *Pyrus* spp. it forms thickened discolored spots bearing large acorn-shaped spore containers. Limited to Europe, not known in the United States.

Juniperus virginiana: France; Germany (general with the hosts).

***Helicobasidium mompa** Tanaka (xxx) ———

This disease attacks many kinds of plants. Kazuo Ito recently listed 104 host species in 76 genera and 45 families. Six species listed are common in the United States and many others belong in genera represented in our forests. The known range of the fungus is stated to be all parts of Japan, Korea, Formosa, and certain unnamed districts in China. The fungus normally lives on living and dead roots in the soil, readily attacks living roots encountered by it, and finally kills the entire plant. It has caused large losses in mulberry trees grown for their leaves as food for silkworms. Food plants such as sweet potatoes and garden vegetables are attacked causing heavy local losses. Trees may be attacked through the small roots, and as a result infection extends into larger roots and finally to the root crown and even higher. The fruiting body is a brown to purple mycelial velvety mat on the surface of dead bark at the base of the tree. Purple rhizomorphs form on the surface of dead parts and small purplish-brown sclerotia form within the bark tissues or in fissures. Should be excluded at all costs.

Asimina triloba: Japan (general).
Cercis canadensis: Japan.
Liriodendron tulipifera: Japan (Meguro, Tokyo).
Pinus strobus: Japan.
Robinia pseudoacacia: Japan (Koma Forest Experiment Station).
Thuja occidentalis: Japan (Meguro, Tokyo).

Helicobasidium purpureum (Tul.) Pat. (xxx) **damping-off**

Caused by rotting of nursery seedling roots when attacked by a number of soil-infesting fungi, which can be identified only by microscopical and cultural studies. The disease is widely distributed in temperate regions and is aggravated by soil conditions suboptimal for the seedlings.

Picea sitchensis: British Isles (14, 70).

Herpotrichia nigra Hart. (x) **brown felt blight**

Found in high elevations or in boreal regions where heavy snow cover lingers late in the spring. It is present in such locations in Siberia, Europe, and North America. Young conifers are especially liable to attack because their lower branches load down with snow and are pressed close to the wet soil. The fungus is favored by low temperature and high humidity so that it coats the needles and twigs with a

gray to black felt of mycelium, which often kills most of the needles. In Europe nurseries at high elevations have had to be abandoned.

Picea glauca: Norway (Bardu).

P. pungens: Norway (Fredriksberg, Malselv); Switzerland (5, Uri).

Hypholoma fasciculare (Huds. ex Fr.) Kummer (x) **root and butt rot**

Soft brown root and butt rot of both conifers and hardwoods; widely but sparsely distributed in North America and Europe. The fungus associated with it has gills and is shaped like the cultivated mushroom. It is one of the unimportant butt rots that may develop more aggressively in one locality than another.

Picea sitchensis: British Isles.

Thuja plicata: British Isles.

Hypoderma desmazierii Duby (xxx) **conifer needle cast**

Needle casts of cedars, firs, larches, pines, and spruces are widely and generally distributed in Europe, Asia, and North America. The fungi causing them are numerous and resemble each other superficially in forming black swollen spots or streaks mostly on the lower surface of the needles. Affected needles turn red to brown, finally gray, and usually fall soon after. All needles even if in the same bundle are not affected. Young seedlings are damaged most seriously; susceptible species in nurseries are sometimes killed. Trees 5 years old or more show individual resistance and remain unaffected among heavily diseased trees in a stand.

Pinus banksiana: Yugoslavia.

P. flexilis: Yugoslavia.

P. strobus: Austria; British Isles; Czechoslovakia; Denmark; France; Germany (9); Russia (5).

Hypodermella ampla (J. J. Davis) Dearn. (xx) **needle cast**

See needle cast under **Hypoderma desmazierii.** Probably introduced to New Zealand fron North America.

Pinus banksiana: New Zealand.

Hysterographium fraxini (Pers. ex Fr.) de N. (x) ———

Causes circular depressed spots in the bark of young stems and branches. The fungus forms small black oblong blisters with a furrowed opening, scattered over the dead bark. The affected parts often die. A severe outbreak in an ash plantation, 8 to 10 feet tall, occurred in Denmark. The fungus is well known in Europe and North America. It is usually saprophytic but occasionally can become aggressively parasitic.

Fraxinus americana: Denmark.

***Kabatiella polyspora** (Bub. & Syd.) Karak. (x) **leaf spot**

Causes angular dark brown spots on the upper leaf surface in Germany.

Acer saccharinum: Germany (Tamsel in Marchia).

Lophodermina juniperina (Fr.) Tehon (xxx) **needle cast**

See needle cast under **Hypoderma desmazierii.** In Europe and North America.

Juniperus virginiana: Denmark (Hofmansgave).

Lophodermina nitens (Darker) Tehon (xxx) **needle cast**

See needle cast under **Hypoderma desmazierii.** In Europe and North America.

Pinus albicaulis: Germany (Mecklenburg).
P. strobus: Germany.

***Lophodermium macrosporum** (Hartig) Rehm (xxx) **needle cast**

See needle cast under **Hypoderma desmazierii.** In Europe.

Picea pungens: Denmark (Forsthaven); Norway (Ås, Mo).
P. sitchensis: Belgium; Denmark (Tegelstruphegn).

Lophodermium piceae (Fckl.) Hoehn. (xxx) **needle cast**

See needle cast under **Hypoderma desmazierii.** In Europe and North America.

Picea engelmannii: Norway (Ås).
P. glauca: Denmark; Norway (Molde).
P. mariana: Norway (general on *Picea*).
P. pungens: Norway.
P. sitchensis: British Isles (Glentress); Denmark (Asserbo, Soholt).

Lophodermium pinastri (Schrad. ex Fr.) Chev. (xxx) **needle cast**

See needle cast under **Hypoderma desmazierii.** In Europe, Asia, Africa, New Zealand, and North America.

Picea sitchensis: British Isles (Scotland); Denmark.
Pinus banksiana: Norway (Ås, Farsund, Ullensaker); Poland (3); Russia (1).
P. contorta: Denmark (general where grown); Norway (Jaeren, Mo).
P. flexilis: Norway (Saltdal).
P. ponderosa: Germany; Russia (1).
P. radiata: New Zealand; South Africa; Spain (1).
P. rigida: Denmark; Germany; Russia (1).
P. strobus: Belgium; Denmark; Germany; Norway.

Macrophomina phaseoli (Maubl.) Ashby (x) **Rhizoctonia root rot**

A root rot of many trees and other plants occurs in practically all parts of the world where root crops can be raised. A sterile fungus of the rhizoctonia type is usually associated with it, but occasionally fruiting bodies are produced. Some fruiting bodies have been obtained in pure cultures. Damage is sometimes heavy, especially in the tropics.

Chamaecyparis lawsoniana: Ceylon.
Cupressus macrocarpa: Ceylon; Uganda.
Pinus echinata: South Africa.
P. muricata: South Africa.
P. radiata: South Africa.

***Melampsora allii-populina** Kleb. (xxx) **poplar-garlic rust**

Heteroecious. This European rust is one of several occurring on poplar leaves. All rusts have a powdery yellow early stage followed by a brown to black, flat, crustlike phase. The rusts have different alternate hosts and may be damaging to both the poplars and the alternate hosts.

Populus trichocarpa: British Isles (Scotland).

Melampsora larici-epitea Kleb. (xxx) **willow rust**

Holarctic. Heteroecious. The willows of North America are attacked by several rusts, and those of the Old World harbor a score or more that have a series of alternate hosts many of which are economic trees and shrubs. On the willows they form small, yellow, powdery pustules followed later by brown, waxy-looking, small, flat crusts. These growths are usually on the lower leaf surface but occasionally on the upper side or even on young shoots. Considerable damage is caused in willow holts by premature defoliation caused by heavy and continued attacks.

Salix herbacea: Norway.
S. reticulata: Norway.

***Melampsora larici-populina** Kleb. (xxx) **larch-poplar rust**

See description under **M. allii-populina.**

Populus balsamifera: British Isles; Norway (3, general in southwest on *Populus* spp.).
P. deltoides: Norway (north to Arctic circle).
P. trichocarpa: British Isles; Norway.

Melampsoridium betulinum (Pers.) Kleb. (xxx) **larch-birch rust**

Heteroecious. On larch leaves, cylindrical tubular outgrowths filled with orange powdery spores form on the lower leaf surface. On the lower surface of birch leaves, small yellow to orange powdery pustules are followed by small, waxy brown crusts breaking through the leaf epidermis. Widely distributed in North America, Europe, and Asia. Some damage is done to young birch seedlings.

Betula lenta: Norway (Ås).
Larix laricina: Denmark (Tange Skov).

***Melasmia empetri** Magn. (xxx) **crowberry black spot**

Holarctic. Appears as black spots on young twigs, the latter abnormally elongated on which small leaves grow. The attacked shoots die. Reported from Russia, Sweden, Germany, and Scotland.

Empetrum nigrum: British Isles.

Meria laricis Vuill. (xxx) **larch needle cast**

This larch needle cast appears on the new young needles and may be confused with frost injury. The affected needles die beyond the point of infection. The fungus fruits form in the stomata, mostly on the lower needle surface, and appear as white dots much like the normal stomata. This disease damages especially 1-year and 2-year seedlings but may attack trees of any age. It overwinters on dead needles and is spread from one place to another by infected plants

shipped to uninfected nurseries. Moist weather greatly favors severe outbreaks. Larch needle cast is widespread, though scattered, in Europe and has been reported once on *Larix occidentalis* in the northern Rocky Mountains. Attention was drawn to it because of its appearance earlier than the usual leaf cast by *Hypodermella laricis*.

Larix occidentalis: British Isles.

***Microdiplodia solitaria** Bub. (xxx) **magnolia leaf spot**

Causes solitary, irregular leaf spots on the upper leaf surface; dry and gray with brown edges above, dingy yellow beneath. Reported from Italy.

Magnolia grandiflora: Italy (Arco, Venetia trident).

Microsphaera alni extensa (Cke. & Pk.) Salmon (xxx) **oak powdery mildew**

Appears on both surfaces of oak leaves as a white powdery coating. Late in summer tiny black globular bodies form on the white coating. First found in France in 1907, and spread over Europe in 1908. For a number of years only the immature conidial form of the fungus developed in Europe. In the conidial stage of the powdery mildews, it is practically impossible to determine the fungi specifically, and a number of guesses were made concerning this one. About 1920 the perfect stage developed and was found to be *Microsphaera alni extensa*, apparently the same as this long-known fungus of North America. Oak powdery mildew has never caused serious trouble here but was disastrous in Europe to Old World oaks, especially on young coppice and nursery stock. Older trees that had suffered severe defoliation by insects were killed over an extensive area.

Quercus alba: Austria; France (Basque Provinces).
Q. bicolor: Austria.
Q. ilicifolia: France (Basque Provinces).
Q. imbricaria: France (Basque Provinces).
Q. laurifolia: Argentina; Madagascar; Rhodesia.
Q. lyrata: Argentina; Madagascar; Rhodesia.
Q. macrocarpa: Argentina; Austria; France (Basque Provinces); Madagascar; Rhodesia.
Q. nigra: Argentina; Madagascar; Rhodesia.
Q. palustris: Argentina; Austria; Brazil; France (Basque Provinces); Madagascar; Rhodesia.
Q. phellos: Argentina; France (Basque Provinces); Madagascar; Rhodesia.
Q. prinus: France (Basque Provinces).
Q. rubra: Austria; France (Basque Provinces).
Q. velutina: France (Basque Provinces).

***Milesia kriegeriana** Magnus (xxx) **Abies-fern rust**

There are about 50 species of these rusts, all with one stage of their life cycle on the needles of *Abies* spp. and the other on the leaves of various ferns. Many rusts cannot be distinguished from each other in the fir stage, but the fern stages show differences by which they can be identified. A considerable number of the fern rusts have not

yet been connected with their fir stages. They are found practically throughout the range of *Abies*. Damage caused is not important.

Abies concolor: British Isles; Switzerland.
A. grandis: British Isles; Switzerland.

***Milesia polypodii** (H. P. Bell) Faull (xxx) **Abies-fern rust**

See description under **M. kriegeriana.**
Abies concolor: British Isles; Switzerland.

***Milesia scolopendrii** (Fckl.) Arth. (xxx) **Abies-fern rust**

See description under **M. kriegeriana.**
Abies concolor: British Isles; Switzerland.

Monochaetia unicornis (Cke. & Ell.) Sacc. (xx) **cypress canker**

This cypress canker is a girdling stem canker of *Cupressus*, which gains entry to the inner bark through wounds. It is probably native in North America and has been carried to Africa and Australia where it greatly damages plantations of all species of *Cupressus* grown there.

Chamaecyparis thyoides: Kenya.
Cupressus arizonica: Kenya.
C. macrocarpa: Kenya.

Mycosphaerella platanifolia (Cke.) Wolf (xxx) **brown leaf spot**

A large irregular brown leaf spot of *Platanus* spp. in Japanese nurseries. Possibly the same as a similar leaf spot of *Platanus* in the United States.

Platanus occidentalis: Japan.

***Myxosporium abietinum** Rostr. (xxx) **root collar girdle**

A serious girdling near the root collar of conifers reported in Denmark.

Picea sitchensis: Denmark (Glorup).
Pinus strobus: Denmark (Silkeborg).
Pseudotsuga menziesii: British Isles; Denmark (Früsenborg).

Naemacyclus niveus (Pers. ex Fr.) Sacc. (xx) **hard pine leaf cast**

See needle cast under **Hypoderma desmazierii.** Distributed widely in Europe; reported in northern and eastern Africa, in northeastern United States, Quebec, Colorado, and the Pacific coast.

Pinus radiata: Kenya; Spain (1).

Nectria cinnabarina Tode ex Fr. (xx) **hardwoods dieback**

This *Nectria* has two growth stages. The first to form is a small, pinkish, cushionlike body breaking through the affected bark in warm weather. The second appears as groups of tiny, globular, cinnabar-red bodies crowded closely together, forming in late fall or early winter some weeks or even months after the early stage. The fungus is one of the numerous saprophytic forms whose growth is occasionally favored by uncommon conditions so that it becomes aggressively parasitic. It is distributed generally in North America and Europe; it is reported in Siberia, Ceylon, India, and Japan and also in New Zealand

and Brazil. Being so widely distributed, it may have developed parasitic strains.

Acer pensylvanicum: Netherlands (2).
A. saccharum: Netherlands (2).
Quercus rubra: Germany (Saxony).
Robinia pseudoacacia: Netherlands (2).

Nectria cucurbitula Tode ex Fr. (xx) **conifer dieback**

Dieback of firs, spruces, and pines originates in an injury to the bark, giving entry of the fungus spores to the inner bark tissues. Apparently it is more prevalent in Europe than in North America. Wounds made by hail and insects feeding are especially favorable for fungus development, an area of bark being killed and enlarged until the stem is girdled and the tip killed back. Conifer dieback seems to be limited to Europe and North America.

Abies amabilis: Norway (Bergen).
A. balsamea: Norway.
A. concolor: Norway.
A. procera: Norway.
Picea glauca: Norway (Hoyland).
P. sitchensis: British Isles (26, 50).
Pinus strobus: Denmark.

Nectria ditissima Tul. (xx) **hardwoods perennial canker**

Many hardwoods are affected by the large perennial canker with greatly swollen irregular callus edges, in North America and Europe generally. This canker is reported also in Brazil, South Africa, and Madagascar. It is severe on cultivated apple and has been called "European apple canker." There is much uncertainty, both in Europe and America, as to which species of Nectria is the cause.

Populus deltoides: Belgium; Denmark.

Nectria galligena Bres. (xx) **hardwoods perennial canker**

See discussion under **N. ditissima.** Possibly identical with *N. ditissima.*

Populus deltoides: Belgium.

***Oidium orbiculare** Nann. (xxx) **powdery mildew**

Powdery mildew of leaves.

Robinia hispida: Italy (11).

***Ophiostoma piceae** (Münch.) Syd. (xx) **blue sapwood stain**

Blue stain in living sapwood of conifers. An Old World species.

Thuja occidentalis: Japan.

Ovularia destructiva (Plowr. & Phil.) Mass. (xxx) **leaf spot**

Known in the United States and northern Europe.

Myrica gale: Denmark.

Pellicularia filamentosa (Pat.) Rogers (xxx) **web blight**

Causes web blight of upper parts of seedlings. Widely distributed in the North Temperate Zone.

Robinia pseudoacacia: Japan (north).

Pestalotia funerea Desm. (x) **conifer leaf blight**

Caused by one of the numerous fungi that are normally saprophytic but occasionally become parasitic. Widely distributed over the world.

Chamaecyparis lawsoniana: Germany (9, 29, 44, Saxony); Netherlands; New Zealand; South Africa.
Cupressus macrocarpa: New Zealand.
Pinus radiata: South Africa.
Pseudotsuga menziesii: France; Germany.
Thuja occidentalis: Denmark; Germany (44).
T. plicata: British Isles; Germany (29, 44, 100).

***Pestalotia hartigii** Tub. (x) **stem girdle**

Found usually on nursery transplants, the stem being girdled near the ground but continuing to grow above the constriction. Apparently no successful inoculations have been made. It has been suggested that stem girdle is primarily due to high surface soil temperatures, but this fact is disputed where mulch was used for winter protection. Affects both conifers and hardwoods. Known over most of Europe and reported doubtfully from South Africa. Said to have caused much damage in Germany to natural beech reproduction.

Abies lasiocarpa: Norway (Softeland).
Pinus radiata: South Africa.
Pseudotsuga menziesii: Germany (9, Saxony).

Pestalotia macrotricha Kleb. (xx) **rhododendron leaf spot**

A silvery gray spot with numerous black dots on the upper leaf surfaces, brown below. Entry to inner leaf tissues is made through injuries. A weak parasite. Known in North America, Europe, and India. Mostly on rhododendrons but occasionally on related species.

Kalmia latifolia: Italy.
Rhododendron maximum: Italy.

***Pestalotia populi-nigrae** Sawada & Ito (xx) **poplar shoot wilt**

A black poplar young-shoot wilt has been known several years in Japan. Current-year shoots show brown areas by mid-June with one or more dead leaves. The areas enlarge rapidly, and often girdle the shoot. Losses in nursery stock may be considerable. *Populus nigra*, *P. nigra italica*, and *P. deltoides* are attacked naturally. Inoculations succeeded also on *P. simonii* Carr. and *P. maximowiczii* Henry, which showed resistance.

Populus deltoides: Japan.

Phacidium infestans Karst. (xxx) **conifer snow blight**

Snow blight of conifers is apparently native in northeastern United States and eastern Canada, and in Europe north of 60° lat. It is favored by heavy snowfall that remains into late spring. The moist condition under melting snow with accompanying low temperatures appears to be necessary for the fungus. The disease appears when the snow melts as a gray-brown mat on the lower branches that had been pressed down on the ground by the snow. The needles are killed below the snow level, but all parts above the snow remain healthy and green. Considerable damage may be done in nurseries and on

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naturally developed reproduction to a height of 2 or 3 feet. Larger trees are able to overcome the loss of their lowest branches.

Abies balsamea: Sweden.
A. concolor: Sweden.
Picea engelmannii: Sweden.
P. pungens: Sweden.
Pinus ponderosa: Sweden.
P. strobus: Sweden.

Phaeocryptopus gäumanni (Rhode) Petr. (xxx) **Douglas-fir needle cast**

First found in 1925 in Switzerland, causing needle cast of Douglas-fir trees about 20 years old. This fungus was at first confused with a similar one on the needles of *Abies* in Europe and North America, but it was found to be distinct and was given its own name. Needles of the previous years' growth are cast, by severe continued attacks, and only the current year's needles are left to support the trees. If continued a number of years, this loss causes decline and final death. The disease appears to be native but relatively innocuous in this country on the Pacific coast and in the Southwest. It has been found in New England damaging plantations. It appears to have been introduced into Europe from North America and is present in Europe from Great Britain eastward to Austria. Inroads of this and other pests of Douglas-fir in Europe caused alarm, but more recently it has been found that in each district there is a race of Douglas-fir that is resistant.

Pseudotsuga menziesii: Austria; Belgium; British Isles (69); Denmark; France; Germany (Wurttemberg); Italy; Latvia; Netherlands; Poland; Sweden; Switzerland; Yugoslavia.

Phleospora robiniae (Lib.) Hoehn. (xxx) **leaf spot**

Leaf spot in France and Italy; also eastern United States.

Robinia pseudoacacia: France; Italy.

Phomopsis abietina (Hart.) Wilson & Hahn (xx) **fir canker**

A girdling canker of firs and Douglas-fir kills branches and stems in young trees. It is known in Europe and North America but occurs locally.

Abies balsamea: Denmark (Holt Plantage, Jutland).
Juniperus virginiana: Denmark (Wedellsborg, Funen).
Pseudotsuga menziesii: Germany (29).

Phomopsis juniperovora Hahn (xxx) **Juniper and cypress blight**

Blight of junipers and cypress species in seed and transplant beds is serious from the Middle West to the Atlantic coast in the United States. Losses may be very high. Resinous cankers of the stems cause death of affected branches and trees. It is also reported in New Zealand, Mozambique, Netherlands, France, and Denmark.

Chamaecyparis lawsoniana: New Zealand.
Cupressus macrocarpa: New Zealand.

***Phomopsis pseudotsugae** Wilson (xxx) **bark canker**

This fungus causes bark canker on trunks and branches of Douglas-fir, *Abies alba*, *Larix* spp., *Cedrus* spp., and *Sequoia gigantea*. It is known only in Europe and apparently is of Old World origin. The cankers form in the dormant season of one year and continue no further. The tree heals over the wound on larger stems and leaves a loose flake of bark, which often hangs on a dead branchlet near the middle of the canker. On branches the part above the canker commonly dies, and the dead bark on the canker is not immediately sloughed off. Small trees may be girdled like the branches and killed. Larger trees are not seriously damaged.

Abies grandis: British Isles to Czechoslovakia—general.
Pinus strobus: Denmark; Germany (104).
Pseudotsuga menziesii: Belgium; British Isles (94); Czechoslovakia; Denmark; France; Germany; Netherlands; Norway; Sweden.
Sequoia gigantea: British Isles to Czechoslovakia—general.
Tsuga heterophylla: British Isles to Czechoslovakia—general.

Phomopsis strobi Syd. (xxx) **pine canker**

Causes bark cankers on the stems and branches of pines in the United States, Europe, and New Zealand. In New Zealand considerable damage has been caused by dieback.

Pinus muricata: New Zealand.
P. radiata: New Zealand.
P. strobus: British Isles: Denmark.
Pseudotsuga menziesii: New Zealand (3).

Phragmidium andersoni Shear (xxx) **cinquefoil rust**

Holarctic. Autoecious. Native in North America, northern Europe, Siberia, Kamchatka, and Japan.

Potentilla fruticosa: Kamchatka.

Phragmidium fusiforme Schroet. (xxx) **rose rust**

Autoecious. On lower surface of leaves and on stems, powdery yellow to brown pustules. Native in North America from Alaska to Oregon and eastward to Ontario, Minnesota, and Michigan; also in Siberia, Japan, Kamchatka, and mountains of Europe, Finland, and Russia.

Rosa acicularis: Kamchatka.

***Phragmidium tuberculatum** J. Müll. (xxx) **rose dust**

Autoecious. Appears on lower leaf surface as powdery yellow to brown pustules. Native in Europe, Asia, and North Africa.

Rosa acicularis: Kamchatka.

Phyllactinia corylea (Pers.) Karst. (xxx) **powdery mildew**

Native in North America and Europe. Probably throughout the North Temperate Zone on many broadleaf trees.

Corylus americana: Denmark (common).

Phyllosticta garryae Cke. & Hark. (xxx) **leaf spot**

Large leaf spot, gray with purple edges. Native in California. Probably carried to Europe on nursery stock.

Garrya elliptica: British Isles (74).

***Phyllosticta macrocarpae** Montem. (xxx) **leaf spot**

Leaf spot large, reddish, irregular, in interveinal areas.

Quercus macrocarpa: Italy (Ghislieri Garden, Papiae).

Phyllosticta magnoliae Sacc. (xxx) **leaf spot**

Spots usually on the upper leaf surface, variable in shape, bleached, with indefinite margins. Reported in United States, England, France, Germany, and Italy.

Magnolia grandiflora: British Isles (74); France; Italy; Germany.

***Phyllosticta neomexicana** Bub. & Kab. (x) **leaf spot**

Spots on both leaf surfaces, sparse, circular to angular, 1 to 2 millimeters in diameter, brownish yellow, drying gray. Reported only from Bohemia.

Robinia neomexicana: Czechoslovakia (1).

***Phyllosticta pallidocarpa** Bub. & Sereb. (x) **leaf spot**

Spots rounded to oblong, 1 to 5 millimeters x 0.5 to 1.5 centimeters, gray with brownish edges. Known only in Russia.

Ribes aureum: Russia (8).

***Phyllosticta populi-nigrae** Allesch. (x) **leaf spot**

Spots irregular, brown, with indistinct margins. Germany and England.

Populus balsamifera: British Isles (Ainsdale, South Lancaster).

***Phyllosticta pteleae** Hollós (x) **leaf spot**

Spots large, irregular, dark brown above, grayish brown below, pallid in the middle. Reported in Hungary.

Ptelea trifoliata: Hungary (Nagy-Koros).

***Phyllosticta rubiodorati** Bub. & Kab. (x) **leaf spot**

Spots on upper leaf surface, sparse, rounded, 1 centimeter across, brown to reddish brown, the dry center lacerated. Reported from Bohemia.

Rubus odoratus: Czechoslovakia (1, Turnau).

Phyllosticta sassafras Cke. (x) **leaf spot**

Leaf spot rounded, dark colored, causing yellowing and leaf fall. Italy and United States.

Sassafras albidum: Italy (11).

Phytophthora cactorum (Leb. et Cohn) Schroet. (xxx)
seedling blight, crown canker

On first-year seedlings of broadleafs and conifer in Europe. Has been known there for many years, causes damping-off; and on cotyledons and first leaves blights the entire plant. Known in North

America but not as damaging as in Europe. Older trees are attacked by being bark-girdled at the base. This fungus is becoming serious in North America but is little mentioned in Europe. The trouble is prevalent practically wherever trees are extensively planted in Europe, eastern Asia, Africa, South America, and North America. The fungus lives in soil and usually causes root rot or bark canker near the soil. Abundant moisture greatly favors outbreaks. The fungus is believed to have come to North America from the Old World many years ago.

Pinus strobus: Germany (9).
Robinia pseudoacacia: Germany.

Phytophthora cinnamomi Rands (x) **seedling blight, crown canker**

Both broadleaf and coniferous nursery seedlings are subject to root rot; older trees show dying of bark near ground level with some liquid exudation. Death often follows. This disease is very widespread on all the continents.

Castanea dentata: Spain (Corunna).
Pinus radiata: Argentina.
Pseudotsuga menziesii: Portugal.
Quercus rubra: France.

Phytophthora citrophthora (R. E. & E. H. Sm.) Leon. (x) **root rot**

On hardwoods and *Pinus radiata* in Argentina: also in United States.

Acer negundo: Argentina.
Juglans nigra: Argentina.
Magnolia grandiflora: Argentina.
Pinus radiata: Argentina.
Robinia pseudoacacia: Argentina.

Phytophthora parasitica Dast. (xxx) **stem canker**

Occurs mostly on broadleaf trees but occasionally on conifers. Mostly attacks parts above-ground. Kills seedlings and damages older trees by causing defoliation and cankers on young stems. Reported from every continent.

Magnolia grandiflora: Argentina.

Pleospora herbarum (Pers. ex Fr.) Rabh. (xxx) **leaf spot**

Brown leaf spots due to cork formation are associated with the fungus on the leaf surface. Known in Europe and the United States.

Arctostaphylos manzanita: British Isles (England).

Pleurotus mitis Pers. ex Fr. (xx) **trunk canker**

Enters injuries on trunks, mostly of conifers but occasionally of broadleaf species. In Europe and North America.

Pinus strobus: Switzerland.

Polyporus schweinitzii Fr. (xxx) **red-brown butt rot**

Distributed widely throughout the Northern Hemisphere and reported in Australia. It occurs mostly in conifers, rarely in hardwoods. In North America it causes much more damage than any other butt

rot; in Europe it appears to be much less important. The fungus is large, velvety brown on top and greenish brown below; often centrally stalked when growing from a buried root, with little or no stem when growing laterally on the sides of trunks; brittle and soft; corky when dry.

Picea sitchensis: British Isles (Perthshire).
Pinus strobus: Denmark.
Pseudotsuga menziesii: British Isles (Perthshire).
Thuja plicata: Poland (Pomorz, Wirty State Forest).

Polyporus sulphureus Fr. (xxx) **sulphur fungus, brown rot**

The sulphur fungus in the United States is typically sulphur yellow above, varying to salmon or orange; in Europe it is described as orange to red. It fruits in a series of closely overlapping irregular shelves, growing out from the side of living trees where a large wound has been made by a large broken branch or a falling tree. It is firm and watery when fresh, drying to white, rigid, and brittle. It is widely distributed and common on hardwoods and conifers in the North Temperate Zone, and is reported from Australia and South Africa. It causes a brown cubical rot of the heartwood, with feltlike sheets of mycelium in the cracks of the rotted wood.

Gleditsia triacanthos: Denmark (South Forsthaven).
Prunus serotina: Denmark.
P. virginiana: Denmark.
Robinia pseudoacacia: Denmark (Faruna, Seeland); France; Japan.

Puccinia caricis (Schum.) Schroet. (xxx) **cluster-cup rust**

Heteroecious. The cluster-cup rust of *Ribes* spp. has no connection with the pine blister rusts. Sedges (*Carex* spp.) are the alternate hosts. The *Ribes* stage looks like tiny cups on the lower side of the leaves and on the fruits. The cups contain orange, dusty spores, which can infect the leaves and stems of sedges. The rust is distributed in temperate Europe, Asia, and North America and is reported in New Zealand. Practically no damage is caused except in large plantings of *Ribes*, and an occasional outbreak may defoliate bushes or spoil fruits.

Ribes aureum: Denmark (Skaarup, Stengaarden).
R. sanguineum: British Isles (Scotland); Denmark (Havrehed, Himmelbjerget).
R. triste: Kamchatka.

Puccinia ribis DC. (xxx) **ribes rust**

Autoecious. Common on wild *Ribes* in the United States; also in Europe, Japan, and Kamchatka. No damage is known.

Ribes triste: Kamchatka.

Pucciniastrum myrtilli (Schum.) Arth. (xxx) **Hemlock-Ericaceae rust**

Holarctic. Heteroecious. The earliest life stage develops on the lower side of hemlock leaves where it forms white, tubular outgrowths containing yellow powdery spores. Various *Ericaceae* are the alternate hosts on which this disease forms pustules with powdery yellow spores on the lower leaf surface. This stage is followed by an over-

wintering stage within the epidermal cells of the host leaf. Widely distributed in the North Temperate Zone and in South America. No serious damage is reported.

Vaccinium vitis-idaea: Asia (1).

***Pucciniastrum padi** (Kunze & Schm.) Diet. (xxx) **spruce cone-cherry rust**

Heteroecious. The first life stage of this rust appears on the inner side of scales of young cones of *Picea abies* as rather large powdery brown pustules. The later stage is on the leaf surfaces of *Prunus padus*, *P. serotina*, and *P. virginiana*. There it forms small yellowish-white pustules on the lower leaf surface, which are followed by small brown crusts on the upper surface. Spores from *Prunus* leaves infect spruce cones in early summer; additional spores form that in turn infect young *Prunus* leaves. There the fungus overwinters to resume growth the next spring.

This rust occurs in Europe and Asia. It is reported in Dominican Republic on cultivated *Prunus* spp., apparently introduced, as it is not known otherwise in North America. Infected spruce cones fail to produce seeds.

Prunus serotina: Germany.

P. virginiana: Norway (3).

Rehmiellopsis abietis (E. Rostr.) O. Rostr. (xxx) **fir tip blight**

Attacks the current year's leaves of the genus *Abies*. In severe attacks most of the leaves of the new twig growth are killed. Repeated attacks decrease the foliage so much that the tree dies. Poor site conditions appear to induce attacks. Found on *Abies lasiocarpa* living leaves in British Columbia once. Whether this is due to introduction of *Abies* from Europe is unknown.

Abies balsamea: Norway (everywhere grown).

A. magnifica: British Isles (Peebles, Scotland).

A. procera: British Isles (37, Midlothian); Denmark (Bornholm).

Rhabdocline pseudotsugae Syd. (xxx) **Douglas-fir mottled leaf cast**

The first symptom of this disease is a slight yellow spotting near the ends of the needles in fall or early winter. The color changes to brown, sharply delimited from the normal green. These areas give the affected needles a mottled appearance. The color turns uniformly brown in severe attacks; in June the blisterlike fruiting bodies form and the leaves fall, giving the tree a sparsely leaved appearance. Repeated attacks cause the loss of all but the current year's needles. The disease is general in North America and in Europe where Douglas-fir is planted. It is an excellent example of the result of shipping young trees to new regions. The future of Douglas-fir in Europe is seriously questioned, but it has been found that "green" Douglas-fir is relatively resistant in Germany. Trees up to 30 years old may be heavily attacked, but older ones seem able to resist without serious injury. *Pseudotsuga menziesii* var. *glauca* is more susceptible than *P. menziesii* var. *menziesii* and is still threatened in Europe. Its use there may have to be discontinued.

Pseudotsuga menziesii: Austria; Belgium; British Isles; Czechoslovakia (1, Marienbad); Denmark; France (Nancy); Germany

(49, Wurttemberg); Netherlands; Norway; Switzerland; Yugoslavia.

Pseudotsuga menziesii var. *glauca:* Belgium (Malmedy); British Isles (48, Kirkennan and Munches Estates, southwest of Dumfries); Denmark; Germany; Netherlands.

Rhizina undulata Fr. (xxx) **root rot**

Occurs as local patches of dead and dying young conifers in nurseries and natural reproduction. Roots of diseased trees are matted together with white strands of mycelium and exuded resin. The annual fruiting bodies develop on the soil as dark brown irregular objects with an undulant surface and white mycelial strands growing down to affected roots. Since the disease is found only where fire has been a year or more previously, it is not usually serious. It is widely spread in North America and Europe.

Picea sitchensis: Germany.
Pinus strobus: Germany.
Pseudotsuga menziesii: Germany.
Tsuga mertensiana: Germany.

Rhizosphaera kalkhoffii Bub. (xxx) **spruce mottled leaf cast**

Usually in late summer needles of the current season become mottled with yellow. The affected needles fall in the second summer and leave only those of the current season. The disease begins on the lower branches and progresses slowly upward. It is known in North America only on spruces in the eastern United States and in southern Quebec, mostly on *Picea pungens*, but is not known in the native range of this tree. This disease is also reported in Europe on spruces, firs, pines, and Douglas-fir. Its original home is not known. Damage consists of the lower branches dying; in Great Britain this leaf cast is reported as killing 14- to 20-year-old trees.

Picea glauca: British Isles (Scotland); Netherlands (2).
P. mariana: British Isles (Scotland).
P. pungens: British Isles; Norway (Skien, Mosjoen).
P. sitchensis: British Isles (106).

Rhytisma acerinum Pers. ex Fr. (xxx) **maple tar spot**

Maple leaf tar spot forms shiny, black, thickened, slightly raised blotches up to ½ inch across on the upper side of the leaf. Many species of *Acer* are attacked in North America, Europe, and Asia. The disease is very common in the United States. Severe infection causes early leaf fall, but damage is slight.

Acer negundo: Germay (10).
A. pensylvanicum: Germany.
A. saccharinum: Denmark (Tange Skov, Funen).
A. saccharum: Germany (10).

***Rosellinia quercina** Hart. (x) **oak root rot**

There are a number of *Rosellinia* species that cause root rot of trees, mostly of younger ages. The species appear much alike, cause similar symptoms, and are apt to attack both broadleafs and conifers. All seem to be favored by wet soils. Wilting of entire plants or terminal shoots, soon followed by death of the plant, is the chief signal of

trouble. The roots are covered with white strands of mycelium on the outside of the bark or between the bark and wood. Sclerotial masses form on the strands and the latter darken in color. Finally, tiny black globular bodies form that contain the reproduction spores. The fungus can live in the soil saprophytically on dead plant material but is very ready to attack living roots. The oak Rosellinia is reported from northern Europe where it inflicts heavy damage in forest nurseries and reproduction. It attacks other hardwoods also and is reported in Japan.

Myrica gale: Denmark ("Asserbo sand dunes," Seeland).

***Rosellinia radiciperda** Mass. (x) **New Zealand root rot**

See **Rosellinia quercina** for an account of the appearance of this disease. The New Zealand root rot attacks both hardwoods and conifers and devastates large areas. Well-cultivated land is said to become free from this trouble, but when the forest is newly cleared, it is serious. This disease appears to be limited to New Zealand.

Chamaecyparis lawsoniana: New Zealand (widespread).

Pinus strobus: New Zealand.

Schizophyllum commune Fr. (xx) ———

A small gray fan-shaped conk, downy above with forked gills below, causes a superficial white rot, especially under sunscorched bark of living trees. Distributed generally in North America, Europe, Asia, and in South Africa and Venezuela.

Robinia pseudoacacia: Portugal.

***Scleroderris abietina** (Lager.) Gremmen (xx) **needle and twig blight**

Causes pine needle and twig blight and considerable damage by killing trees in severe outbreaks. Proved culturally to be the ascigerous stage of *Brunchorstia destruens* Eriksson. In Finland, *Pinus contorta* is one of the most successful conifers, but fungus diseases are causing serious losses. The parasites are usually of minor importance or saprophytic in other countries. Widely distributed in Europe.

Pinus contorta: Finland (Urjala near Lake Nuutajärvi).

P. monticola: British Isles (Scotland).

P. radiata: Spain.

P. resinosa: Denmark.

P. sabiniana: Russia.

P. strobus: British Isles (Scotland).

Septoria acicola (Thuem.) Sacc. (x) **pine needle blight**

On needles of *Pinus radiata* in Spain. Reported on numerous species of pine in the United States.

Pinus radiata: Spain (1).

Septoria curvata (Rab. & A. Braun.) Sacc. (xxx) **brown leaf spot**

Rounded brown leaf spot of *Robinia pseudoacacia* in Europe. Also reported in Ohio.

Robinia pseudoacacia: Germany; Italy; Poland (14); Russia.

Septoria myricae Trail (xxx) **leaf spot**

Leaf spots greenish tinged with brown, 1 to 3 millimeters across, in Scotland and United States.

Myrica gale: British Isles (Scotland, near Aberdeen).

***Septoria pseudacacia** C. Massal. (xxx) **leaf spot**

Leaf spot of *Robinia pseudoacacia.*

Robinia pseudoacacia: Italy (Calavena near Tregnano, Verona).

***Sphaerella elatior** Sacc. & Speg. (xxx) **leaf spot**

Liriodendron tulipifera: Italy (Conegliano).

***Sphaerella pseudoacacia** Auersw. (xxx) **leaf spot**

On petioles.

Robinia pseudoacacia: Germany; Italy (Verona).

***Sphaerella robiniae** Siemaszko (xxx) **leaf spot**

On leaves.

Robinia pseudoacacia: Russia (Smela District).

***Sphaerella sassafras** Ell. & Ev. var. **major** Nann. (xxx) **leaf spot**

Causes yellowing and leaf fall.

Sassafras albidum: Italy (11).

Stagonospora pini Grove (x) **needle blight**

On needles of *Pinus aristata* in Bohemia and on *P. sylvestris* in Ireland. Reported in the United States.

Pinus aristata: Czechoslovakia (1, Kostelec-on-Cernymi Forest).

Stereum rugosum Pers. ex Fr. (xx) **trunk rot**

Conk flat with slight shelving 1 to 3 inches across, concentrically furrowed, buff to gray above. Lower surface bleeds if bruised when fresh. On hardwood trees. Common in Europe, rare in North America.

Quercus rubra: Germany.

Stereum sanguinolentum Alb. & Schw. ex Fr. (xx) **trunk rot**

Conk ½ to 3 inches across, nearly white, flat, and tending to be circular in outline. Lower surface gray, bleeding if bruised when fresh, becoming cracked when dry. It is generally distributed in Canada and the United States, and in Europe. It is also reported in Siberia, Australia, and New Zealand.

Pinus radiata: New Zealand.

Taphrina farlowii Sadebeck (xxx) **swollen fruits**

Generally present in eastern United States on wild cherries. Also found at Charlottenburg, Germany, on *Prunus serotina.* Evidently introduced with its host.

Prunus serotina: Germany (Charlottenburg).

Taphrina populina Fr. (xxx) **leaf blister**

A small yellow convex-concave spot on *Populus* leaves. Widely distributed in Europe, locally in eastern North America, occasionally in western North America. Also in China, India, and Japan. Damage is slight.

Populus deltoides: Denmark.

***Taphrina sadebeckii** Johans. (xxx) **alder leaf blister**

A yellow leaf spot of *Alnus* spp., up to 1 centimeter in diameter. In Europe and Japan.

Alnus rugosa: Sweden (4).

Trametes suaveolens Fr. (xx) **willow white mottled rot**

Mostly on willows, but occasionally on poplars and others. Northern United States and Canada east of Rocky Mountains; and in Europe, Siberia, and South Africa.

Populus deltoides: Denmark.

Trametes trogii Berk. (xx) **trunk rot**

Conk grows nearly flat with small, narrow, shelflike outgrowths; smoky tinged with olive, with coarse brownish hairs on top. Pore surface almost white. On hardwoods usually. Rare. Reported as damaging in Argentina, affecting the trees so that they gradually fall over and finally die. In United States, uncommon.

Pinus radiata: Argentina.

Robinia pseudoacacia: Argentina.

Tranzschelia pruni-spinosae (Pers.) Diet. xxx **Prunus rust**

Heteroecious. Attacks numerous wild cherry species, forming brown, powdery pustules on the lower leaf surface. Various herbaceous plants are alternate hosts for the parasite. Generally distributed in eastern North America and occasionally on the Pacific Coast; also in Central and South America, and in the Old World wherever stone fruits are grown. Severe attacks cause defoliation and may kill trees.

Prunus serotina: Guatemala; Mexico.

P. virginiana: Norway.

Trichoscyphella willkommii (Hart.) Nannf. (xxx) **larch canker**

Attacks young larch stems and branches. Lives perennially but usually girdles only those 1–5 years old. Fruits annually on the inner edges of the canker, which usually exudes resin. The parasite is a small cup, 3–6 millimeters across, orange within and white outside. It occurs in Europe wherever larch is planted in quantity. In 1927 it was discovered in eastern Massachusetts on trees imported some years before. All diseased trees found were destroyed, and it is believed not to have become established, although repeated inspections have found one to several cankers not previously detected. It was found on the closely related *Pseudolarix amabilis* (Nels.) Rehd.

Reports of this on other host genera are believed to be errors in identification owing to earlier confusion of this fungus with others closely related. Very damaging in Europe, being called by European foresters the worst enemy of larch. According to Oppermann it "is more severely damaging to *Larix occidentalis* Nutt. than any other larch, therefore it should not be grown in Denmark." This damage abroad may indicate danger to this species in its native range if the disease once reaches it.

Larix laricina: British Isles (64); Norway (Söfteland).
L. occidentalis: British Isles; Denmark (5).
Pseudotsuga menziesii: Norway (Söfteland).

Uncinula aceris (DC. ex Mérat) Sacc. (xxx) **maple powdery mildew**

Appears as a white or gray, powdery, thin film mostly on the lower leaf surface. In late summer tiny black globular specks, scattered over the white film, develop. Severe attacks may cause defoliation. Usually not damaging except to nursery stock. Widely distributed in North America and Europe, also reported in Japan.

Acer negundo: Germany.

Valsa nivea Fr. (xx) **dieback**

Very common. North America and Europe.

Populus deltoides: Denmark.

Verticillium albo-atrum Reinke & Berth. (xxx) **Verticillium wilt**

First appears as sudden wilting of leaves of single branches, or of one side of the crown, of larger hardwood trees. Small nursery trees wilt and die promptly. This wilt especially attacks nursery, shade, and ornamental trees growing on land that is under cultivation or that has been cultivated. Diseased stems show dark streaks in one or more of the annual rings. The fungus lives in the soil as a saprophyte and attacks roots. Maples are especially susceptible.

The disease was first known in 1879 in Germany. It is now widespread in North America and Europe and is reported from Africa, Australia, and New Zealand. Because of its easy carriage in infected soil, care should be taken not to ship nursery stock from an infected area.

Acer negundo: Italy (Emilian region).
Liriodendron tulipifera: France.
Rhus glabra: Netherlands (2).
R. typhina: Germany; Netherlands (2).
Ribes sanguineum: Netherlands.
Robinia pseudoacacia: Italy.

Mistletoes

***Arceuthobium oxycedri** (DC.) M. Bieb. (xxx) **dwarf mistletoe**

European dwarf mistletoe of juniper occurs in southern Europe. Attacks *Juniperus communis* and *J. oxycedrus* and is reported growing

on *Chamaecyparis thyoides*, causing witches' broom formation on it. Entry should be strictly forbidden.

Chamaecyparis thyoides: Yugoslavia (Istria Peninsula).

***Viscum album** L. (xxx) **European mistletoe**

This mistletoe is similar to that found in southern United States in general appearance and in having several varieties or races. It attacks both hardwoods and conifers. A very dangerous threat.

Abies balsamea: Germany.
A. concolor: Germany.
Acer nigrum: Czechoslovakia (Eisgrub); Germany (Munich).
A. rubrum: France (57); Poland (10).
A. saccharinum: Czechoslovakia (Eisgrub); Germany (Munich); Poland (10).
Aesculus octandra: Germany (Munich).
Celtis occidentalis: Germany (Munich).
Crataegus pedicellata: Germany (Munich).
Fraxinus americana: Czechoslovakia (Eisgrub); Germany (Munich).
F. pennsylvanica: Germany (Munich).
Gleditsia triacanthos: France (57).
Juglans cinerea: France (57).
J. nigra: Czechoslovakia (Eisgrub); France (57); Germany (Munich).
Juniperus virginiana: Germany.
Picea pungens: Germany.
P. sitchensis: Germany.
Pinus banksiana: Germany.
P. resinosa: Germany.
P. strobus: Germany.
Populus balsamifera: Germany.
Quercus rubra: Czechoslovakia (Eisgrub); Germany (Munich).
Robinia pseudoacacia: Czechoslovakia (Eisgrub); France (57); Poland (10).
Tilia americana: Germany.

HOST INDEX OF THE DISEASES

The host trees are listed alphabetically by their Latin names. The reported pathogens on each host are listed alphabetically within their groups by their Latin names but without authorities or common names because these are given in the preceding section.

Abies amabilis **Pacific silver fir**
Nectria cucurbitula

Abies balsamea **balsam fir**
Dasyscypha calyciformis
Fomes annosus
F. pini
Fusoma parasiticum
Nectria cucurbitula
Phacidium infestans
Phomopsis abietina
Rehmiellopsis abietis
Viscum album

Abies concolor **white fir**
Dasyscypha calyciformis
Fusoma parasiticum
Milesia kriegeriana
M. polypodii
M. scolopendrii
Nectria cucurbitula
Phacidium infestans
Viscum album

Abies fraseri **Fraser fir**
Dasyscypha calyciformis

Abies grandis **grand fir**
Dasyscypha calyciformis
Fomes annosus
Milesia kriegeriana
Phomopsis pseudotsugae

Abies lasiocarpa **subalpine fir**
Armillaria mellea
Pestalotia hartigii

Abies magnifica **California red fir**
Rehmiellopsis abietis

Abies procera **noble fir**
Armillaria mellea
Cucurbitaria pithyophila
Dasyscypha calyciformis
Fomes annosus
Fusoma parasiticum
Nectria cucurbitula
Rehmiellopsis abietis

Acer negundo **boxelder**
Virus, mosaic
Xanthomonas acernea
Gloeosporium acerinum
Gnomonia cerastis negundinis
Phytophthora citrophthora
Rhytisma acerinum
Uncinula aceris
Verticillium albo-atrum

Acer nigrum **black maple**
Viscum album

Acer pensylvanicum **striped maple**
Gloeosporium vagans
Nectria cinnabarina
Rhytisma acerinum

Acer rubrum **red maple**
Daedalea unicolor
Viscum album

Acer saccharinum **silver maple**
Xanthomonas acernea
Daedalea unicolor
Kabatiella polyspora
Rhytisma acerinum
Viscum album

Acer saccharum **sugar maple**
Nectria cinnabarina
Rhytisma acerinum

Aesculus octandra **yellow buckeye**
Viscum album

Aesculus parviflora **bottlebrush buckeye**
Botrytis cinerea

Aesculus pavia **red buckeye**
Botrytis cinerea

Alnus rugosa **speckled alder**
Taphrina sadebeckii

Arctostaphylos manzanita **big manzanita**
Pleospora herbarum

Asimina triloba **pawpaw**
Helicobasidium mompa

Berberis canadensis **Allegany barberry**
Pseudomonas berberidis

Betula lenta **sweet birch**
Melampsoridium betulinum

Campanula rotundifolia **bluebell**
Coleosporium campanulae

Castanea dentata **American chestnut**
Dothidea noxia
Phytophthora cinnamoni

Castilleja pallida **paintedcup**
Cronartium kamtschaticum

Catalpa bignonioides **southern catalpa**
Gloeosporium microstromoides

Celtis occidentalis **hackberry**
Viscum album

Cercis canadensis **eastern redbud**
Helicobasidium mompa

Chamaecyparis lawsoniana **Port-Orford-cedar**
Armillaria mellea
Diplodia pinea
Fomes annosus
Fusoma parasiticum
Macrophomina phaseoli
Pestalotia funerea
Phomopsis juniperovora
Rosellinia radiciperda

Chamaecyparis thyoides **Atlantic white-cedar**
Armillaria mellea
Monochaetia unicornis
Arceuthobium oxycedri

Chamaedaphne calyculata **leatherleaf**
Chrysomyxa cassandrae

Cladrastis lutea **yellowwood**
Ascochyta cladrastidis

Corylus americana **American hazel (or filbert)**
Phyllactinia corylea

Crataegus pedicellata **scarlet hawthorn**
Viscum album

Crataegus succulenta **fleshy hawthorn**
Gymnosporangium juniperinum

Cypressus arizonica **Arizona cypress**
Monochaetia unicornis

Cupressus macrocarpa **Monterey cypress**
Botrytis cinerea
Corticium salmonicolor
Macrophomina phaseoli
Monochaetia unicornis
Pestalotia funerea
Phomopsis juniperovora

Diervilla lonicera **dwarf bushhoneysuckle**
Ascochyta diervillae

Empetrum nigrum **black crowberry**
Chrysomyxa empetri
Melasmia empetri

Fraxinus americana **white ash**
Hysterographium fraxini
Viscum album

Fraxinus pennsylvanica **green ash**
Viscum album

Garrya elliptica **wavyleaf silktassel**
Phyllosticta garryae

Gleditsia triacanthos **honeylocust**
Polyporus sulphureus
Viscum album

Juglans californica **California walnut**
Gnomonia leptostyla

Juglans cinerea **butternut**
Gnomonia leptostyla
Viscum album

Juglans hindsii **Hinds walnut**
Xanthomonas juglandis

Juglans nigra **black walnut**
Phytophthora citrophthora
Viscum album

Juniperus communis **common juniper**
Fomes annosus
Gymnosporangium aurantiacum
Lophodermina juniperina

Juniperus virginiana **eastern redcedar**
Fusoma parasiticum
Gymnosporangium bermudianum
G. mespili
G. sabinae
Lophodermium juniperinum

Phomopsis abietina
Viscum album

Kalmia latifolia **mountain-laurel**
Pestalotia macrotricha

Larix laricina **tamarack**
Melampsoridium betulinum
Trichoscyphella willkommii

Larix occidentalis **western larch**
Meria laricis
Trichoscyphella willkommii

Libocedrus decurrens **incense-cedar**
Armillaria mellea
Fusoma parasiticum

Liriodendron tulipifera **yellow-poplar (tuliptree)**
Helicobasidium mompa
Sphaerella elatior
Verticillium albo-atrum

Magnolia grandiflora **southern magnolia**
Microdiplodia solitaria
Phyllosticta magnoliae
Phytophthora citrophthora
P. parasitica

Mahonia aquifolium **Oregon grape**
Cumminsiella sanguinea

Myrica gale **sweetgale**
Rosellinia quercina
Septoria myricae

Osmaronia cerasiformis **osoberry**
Ascochyta zimmermanni hugonis

Parthenocissus quinquefolia **Virginia creeper**
Armillaria mellea

Picea engelmannii **Engelmann spruce**
Armillaria mellea
Chrysomyxa abietis
Fusoma parasiticum
Lophodermium piceae
Phacidium infestans

Picea glauca **white spruce**
Chrysomyxa abietis
Fomes annosus
Fusoma parasiticum
Herpotrichia nigra
Lophodermium piceae
Nectria cucurbitula
Rhizosphaera kalkhoffii

Picea mariana **black spruce**
Lophodermium piceae
Rhizosphaera kalkhoffii

Picea pungens **blue spruce**
Armillaria melea
Chrysomyxa abietis
C. ledi var. *rhododendri*
Cucurbitaria piceae
C. pithyophila
Diplodina parasitica
Fomes annosus
Fusoma parasiticum
Herpotrichia nigra
Lophodermium macrosporum
L. piceae
Phacidium infestans
Rhizosphaera kalkhoffii
Viscum album

Picea rubens **red spruce**
Chrysomyxa abietis
Fusoma parasiticum

Picea sitchensis **Sitka spruce**
Armillaria mellea
Chrysomyxa abietis
Dasyscypha calyciformis
Diplodina parasitica
Fomes annosus
Fusoma parasiticum
Helicobasidium purpureum
Hypholoma fasciculare
Lophodermium macrosporum
L. piceae
L. pinastri
Myxosporium abietinum
Nectria cucurbitula
Polyporus schweinitzii
Rhizina undulata
Rhizosphaera kalkhoffii
Viscum album

Pinus albicaulis **whitebark pine**
Cronartium ribicola
Lophodermina nitens

Pinus aristata **bristlecone pine**
Cronartium ribicola
Stagonospora pini

Pinus attenuata **knobcone pine**
Cenangium abietis

Pinus balfouriana **foxtail pine**
Cronartium ribicola

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Pinus banksiana **jack pine**
Armillaria mellea
Fomes annosus
Fusoma parasiticum
Hypoderma desmazierii
Hypodermella ampla
Lophodermium pinastri
Viscum album

Pinus contorta **lodgepole pine**
Armillaria mellea
Cenangium abietis
Crumenula pinicola
C. sororia
Dasyscypha calyciformis
D. pini
D. resinaria
D. subtilissima
Diplodia pinea
Excipulina pinea
Fomes annosus
Fusoma parasiticum
Lophodermium pinastri
Scleroderris abietina

Pinus coulteri **Coulter pine**
Diplodia pinea

Pinus echinata **shortleaf pine**
Macrophomina phaseoli

Pinus elliottii **slash pine**
Armillaria mellea
Diplodia natalensis
D. pinea

Pinus flexilis **limber pine**
Cronartium ribicola
Hypoderma desmazierii
Lophodermium pinastri

Pinus jeffreyi **Jeffrey pine**
Armillaria mellea

Pinus lambertiana **sugar pine**
Cronartium ribicola

Pinus monticola **western white pine**
Armillaria mellea
Cronartium ribicola
Scleroderris abietina

Pinus muricata **bishop pine**
Diplodia pinea
Macrophomina phaseoli
Phomopsis strobi

Pinus palustris **longleaf pine**
Diplodia pinea
Fomes annosus

Pinus ponderosa **ponderosa pine**
Armillaria mellea
Fusoma parasiticum
Lophodermium pinastri
Phacidium infestans

Pinus radiata **Monterey pine**
Armillaria mellea
Botrytis cinerea
Ceratostomella pilifera
Diplodia acicola
D. pinea
Fusarium oxysporum
Lophodermium pinastri
Macrophomina phaeseoli
Naemacyclus niveus
Pestalotia funerea
P. hartigii
Phomopsis strobi
Phytophthora cinnamomi
P. citrophthora
Scleroderris abietina
Septoria acicola
Stereum sanguinolentum
Trametes trogii

Pinus resinosa
red pine ("Norway pine")
Scleroderris abietina
Viscum album

Pinus rigida **pitch pine**
Armillaria mellea
Cenangium abietis
Lophodermium pinastri

Pinus sabiniana **Digger pine**
Diplodia pinea
Scleroderris abietina

Pinus strobus **eastern white pine**
Armillaria mellea
Cenangium abietis
Cronartium ribicola
Crumenula pinicola
Cucurbitaria pithyophila
Dasyscypha subtilissima
Diplodia pinea
Excipula strobi
Excipulina pinea
Fomes annosus
F. pini
Helicobasidium mompa
Hypoderma desmazierii
Lophodermina nitens
Myxosporium abietinum
Nectria cucurbitula

Phacidium infestans
Phomopsis pseudotsugae
P. strobi
Phytophthora cactorum
Pleurotus mitis
Polyporus schweinitzii
Rhizina undulata
Rosellinia radiciperda
Scleroderris abietina
Viscum album

Pinus taeda **loblolly pine**
Armillaria mellea
Diplodia natalensis
D. pinea

Platanus occidentalis **American sycamore**
Gnomonia veneta
Mycosphaerella platanifolia

Populus balsamifera **balsam poplar**
Virus, mosaic
Cytospora chrysosperma
Dothichiza populea
Fomes applanatus
Melampsora larici-populina
Phyllosticta populi-nigrae
Viscum album

Populous deltoides **eastern cottonwood**
Cytospora chrysosperma
Dothichiza populea
Fomes applanatus
F. connatus
F. igniarius
Melampsora larici-populina
Nectria ditissima
N. galligena
Pestalotia populi-nigrae
Taphrina populina
Trametes suaveolens
Valsa nivea

Populus fremontii **Fremont cottonwood**
Dothichiza populea

Populus fremontii var. **wislizenii** **Rio Grande cottonwood**
Dothichiza populea

Populus trichocarpa **black cottonwood**
Pseudomonas syringae f. *populea*
Dothichiza populea
Melampsora allii-populina
M. larici-populina

Potentilla fruticosa **cinquefoil**
Phragmidium andersoni

Prunus besseyi **Bessey cherry**
Botrytis cinerea

Prunus serotina **black cherry**
Polyporus sulphureus
Pucciniastrum padi
Taphrina farlowii
Tranzschelia pruni-spinosae

Prunus virginiana **common chokecherry**
Polyporus sulphureus
Pucciniastrum padi
Tranzschelia pruni-spinosae

Pseudotsuga menziesii **Douglas-fir**
Aleurodiscus amorphus
Armillaria mellea
Botrytis cinerea
Chrysomyxa woronini
Dasyscypha resinaria
Diplodia pinea
Fomes annosus
F. pini
Fusoma parasiticum
Myxosporium abietinum
Pestalotia funerea
P. hartigii
Phaeocryptopus gäumanni
Phomopsis abietina
P. pseudotsugae
P. strobi
Phytophthora cinnamomi
Polyporus schweinitzii
Rhabdocline pseudotsugae
Rhizina undulata
Trichoscyphella willkommii

Ptelea trifoliata **common hoptree**
Ascochyta pteleae
Phyllosticta pteleae

Pyrola minor **snowline pyrola**
Chrysomyxa pyrolae

Pyrola rotundifolia **European pyrola**
Chrysomyxa pyrolae

Pyrola secunda **sidebells pyrola**
Chrysomyxa pyrolae

Quercus alba **white oak**
Gloeosporium quercinum
Microsphaera alni extensa

Quercus bicolor **swamp white oak**
Gloeosporium quercinum
Microsphaera alni extensa

Quercus coccinea **scarlet oak**
Fusicoccum mac-alpini
Gloeosporium quercinum

Quercus ilicifolia **bear oak**
Microsphaera alni extensa

Quercus imbricaria **shingle oak**
Microsphaera alni extensa

Quercus laurifolia **laurel oak**
Microsphaera alni extensa

Quercus lyrata **overcup oak**
Microsphaera alni extensa

Quercus macrocarpa **bur oak**
Gloeosporium quercinum
Microsphaera alni extensa
Phyllosticta macrocarpae

Quercus nigra **water oak**
Microsphaera alni extensa

Quercus palustris **pin oak**
Microsphaera alni extensa

Quercus phellos **willow oak**
Microsphaera alni extensa

Quercus prinus **chestnut oak**
Gloeosporium quercinum
Microsphaera alni extensa

Quercus rubra **northern red oak**
Ciborinia candolleana
Dothidea noxia
Gloeosporium quercinum
G. variabilisporum
Microsphaera alni extensa
Nectria cinnabarina
Phytophthora cinnamomi
Stereum rugosum
Viscum album

Quercus stellata **post oak**
Gloeosporium quercinum

Quercus velutina **black oak**
Microsphaera alni extensa

Rhododendron maximum **rosebay rhododendron**
Pestalotia macrotricha

Rhus glabra **smooth sumac**
Verticillium albo-atrum

Rhus typhina **staghorn sumac**
Botryodiplodia rhois
Verticillium albo-atrum

Ribes americanum **American black currant**
Cronartium ribicola

Ribes aureum **golden currant**
Phyllosticta pallidocarpa
Puccinia caricis

Ribes odoratum **clove currant**
Cronartium ribicola

Ribes sanguineum **winter currant**
Cronartium ribicola
Puccinia caricis
Verticillium albo-atrum

Ribes triste **American red currant**
Puccinia caricis
P. ribis

Robinia hispida **rose-acacia locust**
Erysiphe polygoni

Robinia neomexicana **New-Mexican locust**
Phyllosticta neomexicana

Robinia pseudoacacia **black locust**
Virus, witches' broom
Ascochyta robiniae
Daedalea unicolor
Diaporthe oncostoma
Fomes fraxineus
F. robustus
Fusarium herbarum
F. pseudacaciae
F. sambucinum var. *coeruleum*
F. vogelii
Ganoderma sessile
Helicobasidium mompa
Nectria cinnabarina
Pellicularia filamentosa
Phleospora robiniae
Phytophthora cactorum
P. citrophthora
Polyporus sulphureus
Schizophyllum commune
Septoria curvata
S. pseudacacia
Sphaerella robiniae
Trametes trogii
Verticillium albo-atrum
Viscum album

Rosa acicularis **prickly rose**
Phragmidium fusiforme
P. tuberculatum

Rubus odoratus **fragrant thimbleberry**
Phyllosticta rubiodorati

Salix herbacea **pygmy willow**
Melampsora larici-epitea

Salix reticulata **netleaf willow**
Melampsora larici-epitea

Sassafras albidum **sassafras**
Phyllosticta sassafras
Sphaerella sassafras

Sequoia gigantea **giant sequoia**
Armillaria mellea
Fomes annosus
Phomopsis pseudotsugae

Sequoia sempervirens **redwood**
Fomes annosus

Sorbus americana
American mountain-ash
Gymnosporangium aurantiacum
G. clavariaeforme

Symphoricarpos albus
common snowberry
Ascochyta vulgaris var. *symphoricarpi*
Ascochytula symphoricarpi

Thuja occidentalis
northern white-cedar
Armillaria mellea
Didymascella thujina
Fomes annosus
Fusoma parasiticum
Helicobasidium mompa
Pestalotia funerea

Thuja plicata **western redcedar**
Armillaria mellea
Botrytis cinerea
Didymascella thujina
Fomes annosus
Fusoma parasiticum
Hypholoma fasciculare
Pestalotia funerea
Polyporus schweinitzii

Tilia americana **American basswood**
Viscum album

Tsuga canadensis **eastern hemlock**
Acanthostigma parasiticum
Didymascella tsugae
Fusoma parasiticum

Tsuga heterophylla
western hemlock
Armillaria mellea
Fomes annosus
Phomopsis pseudotsugae

Tsuga mertensiana
mountain hemlock
Rhizina undulata

Ulmus americana **American elm**
Ceratostomella ulmi
Gloeosporium inconspicuum

Vaccinium vitis-idaea **cowberry**
Pucciniastrum myrtilli

SPECIES PLANTED ABROAD

In this survey of diseases of North American trees abroad, the locations of selected foreign plantations of North American trees are listed. The general locations of plantings are listed by countries, with annotations describing numbers or areas of each tree species and types of stands. This list may seem long, but it must be remembered that in Europe there are hundreds of town, communal, and state forests as well as a great number of large wooded estates. Exotics are commonly planted in all of them. Where only the country is given, there is no information concerning locality in that country.

Inspection of this list reveals that very few of our species are reported in Asia. Yet the tree flora of Asia is much more closely related to that of North America than is that of any other region. Many Asiatic trees belong to the same genera as many of the North American timber trees. Because of this similarity and the large number of Asiatic tree species, their parasitic diseases are a great potential threat to North American forests and vice versa. If and when such matters may be possible, test plantings of selected American trees in forested areas of Asiatic countries would give information on their value and usefulness, as well as their susceptibility to Asiatic tree diseases. Such tests might be of great value to either part of the problem, and the value is likely to increase with the age of the plantations.

Abies amabilis (Dougl.) Forbes **Pacific silver fir**

This species is the most vigorous of the genus *Abies* in Europe. It thrives in northwestern Germany and parts of Denmark. There are many fine trees in England, Scotland, and Ireland.

Belgium: Cedrogne, Grand Bois, St. Michel (plantations), Tervueren (group planting).

British Isles: Introduced about 1830; cultivated as ornamental in moister areas; not grown in plantations. Bedgebury, Cluny, Dawyck, Hope Toun, Murthly, New Forest, Nymans, Tubney.

Denmark: Langdal plantation.

Finland: Mustila.

France: Barbier nurseries, Barres, Côtes, Fosse, Maulévrie, Trianon (Ecole d'Horticulture).

Germany: Augsburg, Baden-Baden, Eberswalde (groups and mixed stands), Frankfurt a. Main, Falkenstein, Fürstlich Drehna, Gadow, Harburg a. d. Elbe, Hohen-Niendorf, Kromlau, Pförten (large group), Prussia (groups of 5 ares or more), Riddagshausen, Schwerin, Tannenhöft, Tharandt, Weinheim (mixed plantings).

Italy: Florence, Rovelli nurseries (Lac Majeur region).

Netherlands: Schovenhorst.

Norway: Söfteland, south of Bergen.

Poland: Glogau, Gosda.

Sweden: Jönköping.

Abies balsamea (L.) Mill. **balsam fir**

Australia: Westbourne Woods.
Austria: Altmünster; also five areas (1,900 trees) in state and communal forests, locations unknown.
Belgium: Cedrogne, Gedinne, Grand Bois, St. Michel (plantations), Tervueren.
British Isles: No horticultural value in England. More successful in Denmark and Norway. Bagley Wood, Bedgebury, Benmore, Cluny, Nymans, Stanage Park, Tubney.
Denmark: Häsede, Knuthenborg, Sölestedgaard (group plantings).
Finland: Mustila, Pekola, Tammisto.
France: Barres, Fremont, Harcourt, Maulévrie, Mt. Aigoual, Pézanin, Trianon (Ecole d'Horticulture), Vilmorin.
Germany: Augsburg (planted in groups and mixtures, 3,700 hectares in forests), Buddenhagen, Dilborn, Falkenstein, Grafrath, Harburg a. d. Elbe, Heidelberg, Hohenheim, Hohen-Niendorf, Mainau Island, Passau, Riddagshausen, Schlemmin (extensive plantings of exotics), Schleswig-Holstein, Seebach Forsthaus (groups of 100), Sophienhof (3,600 morgen planted in closed stands), Tannenhöft, Tharandt, Trier, Weimar, Weinheim, Wendisch-Wilmersdorf, Wissen.
Latvia: Riga.
Netherlands: Schovenhorst.
Norway.
Poland: Danzig, Gleiwitz, Gosda, Königsberg, Klanin, Oliva.
Portugal: Bussaco.
Russia: Bryansk, Moscow.
Sweden.
Switzerland: Engadine.

Abies bracteata D. Don **bristlecone fir**

Uncommon to rare in Europe.
British Isles: Eastnor Castle, Nymans.
France: Barres, Fosse, Harcourt, Maulévrie, Nouan, Rennes, Vilmorin.

Abies concolor (Gord. & Glend.) Lindl. **white fir**

Old trees in north Scotland; fruited at Barres, France; reproduced naturally at Côtes, France.

Australia: Westbourne Woods.
Austria: Vienna.
Belgium: Capucins, Cedrogne, Gedinne, Grand Bois, St. Michel (plantations), Sept-Fontaines, Tervueren.
British Isles: Does well as ornamental; might be of value as forest tree in western England and in Scotland. Bagley Wood, Bedgebury, Benmore, Cirencester, Colesborne, Dawyck, Eastnor Castle, Glendy Woods, Inverary, Linton Park, Monk Hopton, Nymans, Stratfield Saye, Tubney.
Denmark: Brahetrolleborg, Charlottenlund, Copenhagen, Gisselfeld, Häsede, Hostenhuus, Knuthenborg, Langesoe, Sölestedgaard (group planting).
Finland: Helsingfors, Mustila, Pekola, Tammisto.
France: Barbier nurseries, Barres, Bois de Boulogne, Champeaux, Fosse, Harcourt, Limoges, Maulevrie, Mt. Aigoual, Nouan, Rennes, Strasbourg, Vilmorin, Verrieres.
Germany: Aachen, Altona, Augsburg, Baden-Baden, Badenweiler, Barnstorf, Bavaria (1,760 trees), Bonn Botanic Gardens, Cannstatt, Cologne

City Forest, Cronberg, Dahlem, Darmstadt Botanic Garden (3,500 spp. and varieties), Dörenthe, Eberswalde (group and mixed stands), Erlangen, Falkenstein, Gracht, Grafrath, Haag Park, Harbke Park (10.5 hectares), Harburg a. d. Elbe, Heidelberg City Forest, Hohenheim, Hohen-Niendorf, Kaartz, Kattmannskamp (groups and mixtures), Lindau, Lousberg Villa, Mainau Island, Nürnberg, Passau, Pförten (80,000 morgen), Pillnitz, Prussia, Putbus, Riddagshausen, Scharfenberg (planted close in mixtures), Schlosse Friedrichshof, Schwerin, Seebach Forsthaus (groups of 100), Sophienhof (500 trees), Tannenhöft, Tharandt, Weimar, Weinheim (planted in mixtures and along driveways), Wendisch-Wilmersdorf, Wiesbaden, Wissen, Wörlitz Park.

Hungary: Godollo.

Italy: Isola Bella (region of Lac Majeur).

Latvia: Riga.

Luxembourg.

Netherlands: Schovenhorst.

New Zealand.

Norway.

Poland: Allenstein, Danzig, Freienhuben, Gleiwitz, Glogau, Königsberg, Oliva, Prussia, Sagan.

Russia: Bryansk region, Moscow.

South Africa.

Spain: Madrid (trees largely same as in Paris).

Sweden: Alnarp, Jönköping.

Switzerland: Lucerne, Zurich.

Yugoslavia.

Abies fraseri (Pursh) Poir. **Fraser fir**

Belgium: Gedinne, St. Michel (plantations).

British Isles: Short-lived; not grown much. Bedgebury, Cluny, Colesborne, Murthly, Tubney.

Finland: Mustila, Tammisto.

France: Barres, Harcourt.

Germany: Augsburg, Eisenach, Lousberg Villa, Schleswig-Holstein, Sophienhof, Wendisch-Wilmersdorf.

Latvia: Riga.

Netherlands: Schovenhorst.

Norway: Christiana.

Russia: Moscow.

Sweden: Stockholm.

Abies grandis (Dougl.) Lindl. **grand fir**

Australia: Victoria.

Austria: Vienna.

Belgium: Ardennes, Belle-Étoile (Soignes forest), Bloemendael, Cedrogne, Capucins, Gedinne, Grand Bois, Groenhove, Nassogne, St. Michel (plantations), Sept-Fontaines, Tervueren.

British Isles: Produces a larger volume of timber than any other *Abies*. Bagley Wood, Beaufort Castle, Bedgebury, Benmore, Brahan, Cluny, Colesborne, Dawyck, Dunach, Durris, Eastnor Castle, Fulmodestone Wood, Glendye Woods, Hatfield Estate, Heckfield Place, Highclere, Hope Toun, Inverary, Maiden Bradley Woods, Murthly, New Forest, Novar Estate, Nymans, Penrhyn Castle, Silia, Stratfield Saye, Tring, Tubney.

Denmark: Aalholm, Charlottenlund, Copenhagen, Häsede, Hindsgavl, Knuthenborg, Langdal plantation, Langesoe, Sölestedgaard.
Finland: Pekola, Tammisto.
France: Amance, Barbier nurseries, Barres, Campeaux, Champenous Foret (Nancy), Côtes, Fosse, Fremont, Harcourt, Jonchere, Limoges, Maulévrie, Mt. Aigoual, Nouan, Pézanin, Rennes, Sénéclauze Estate, Trianon (Ecole d'Horticulture), Verrieres, Vilmorin.
Germany: Aachen, Augsburg, Barnstorf, Cronberg, Darmstadt Botanic Garden, Eberswalde (group and mixed stands), Eisenach, Falkenstein, Freienwalde, Heidelberg City Forest, Hohen-Niendorf, Karlsruhe, Kattmannskamp (groups, mixtures), Lörsfeld, Lousberg Villa, Münster, Pillnitz, Prussia (in groups of 5 ares or over), Riddagshausen, Schleswig-Holstein, Schwerin, Tharandt, Weinheim (in mixtures), Wendisch-Wilmersdorf, Wörlitz Park.
Netherlands: Schovenhorst.
New Zealand.
Norway: Söfteland, south of Bergen.
Sweden: Alnarp.
Switzerland: Canton Bern, Lucerne.
Yugoslavia.

Abies lasiocarpa (Hook.) Nutt. **subalpine fir**

Belgium: Cedrogne, Gedinne, St. Michel (plantations), Tervueren.
British Isles: Very rare. Bedgebury, Benmore, Cluny, Heckfield Place, Hope Toun, Murthly, Nymans, Powerscourt, Stanage Park, Stratfield Saye, Tubney.
Denmark: Copenhagen.
Finland: Mustila, Tammisto.
France: Barbier nurseries, Barres, Bois de Boulogne, Catros, Côtes (reproduced naturally), Fosse, Fremont, Harcourt, Limoges, Maulévrie, Mt. Aigoual, Nouan, Pézanin, Rennes, Sénéclauze Estate, Vilmorin, Verrieres.
Germany: Altona, Augsburg, Falkenstein, Gadow, Heidelberg, Lousberg Villa, Seebach, Tannenhöft, Tharandt, Weinheim (forest stand), Wendisch-Wilmersdorf, Wiesbaden.
Iceland.
Italy: Isola Madre (Lac Majeur region).
Latvia: Riga.
Netherlands: Schovenhorst.
Norway: Söfteland, south of Bergen.
Poland: Danzig, Freienhuben, Glogau, Königsberg.
Portugal: Cintra-Pena (one of richest tree collections in Europe).
Russia: Moscow.
Sweden: Jönköping.

Abies lasiocarpa var. **arizonica** (Merriam) Lemm. **corkbark fir**

Austria: Vienna.
Belgium: St. Michel (plantations).
British Isles: Tubney.
Finland: Pekola, Tammisto.
France: Barres, Champeaux, Fosse, Harcourt.
Germany: Altona, Augsburg, Cronberg, Darmstadt Botanic Garden, Dörenthe, Falkenstein, Magdeburg, Riddagshausen, Schlemmin, Schwerin, Wendisch-Wilmersdorf.
Latvia: Riga.

Netherlands: Schovenhorst, Wageningen.
Poland: Prussia.
Romania: Hatarmajor.
Russia: Moscow.
Switzerland: Lucerne.

Abies magnifica A. Murr. **California red fir**

Belgium: Grand Bois.
British Isles: Rare in Ireland; numerous and larger in Scotland; not plentiful in England. Bayfordbury, Bedgebury, Cluny, Dawyck, Durris, Fulmodestone Wood, Hope Toun, Murthly, Nymans, Tubney.
Denmark: Charlottenlund, Copenhagen, Knuthenborg.
France: Barbier nurseries, Barres, Côtes, Fosse, Harcourt.
Germany: Augsburg, Cronberg, Dörenthe, Gadow, Heidelberg City Forest, Hohen-Neindorf, Pförten (large group), Riddagshausen.
Netherlands: Schovenhorst.
South Africa.
Sweden: Jönköping.

Abies magnifica var. **shastensis** Lemm. **Shasta red fir**

Belgium: Tervueren.
France: Barres.

Abies procera Rehd. **noble fir**

Austria: Altmünster.
Belgium: Bloemendael, Cedrogne, Gedinne, Grand Bois, Louvain, Nassogne, St. Michel (plantations), Sept-Fontaines, Tervueren, Three Kings Park.
British Isles: Planted extensively under forest conditions; not good in warmer parts of Britain; does particularly well in northern Scotland. Ardchullary, Ardvourlie, Bagley Wood, Bedgebury, Benmore, Brahan, Cluny, Colesborne, Corrour, Curraghmore, Dawyck, Dunach, Durris, Falcondale, Fulmodestone Wood, Hope Toun, Invernesshire, Murthly, New Forest, Novar Estate, Nymans, Penrhyn Estate, Powerscourt, Silia, Stourhead, Stratfield Saye, Tubney.
Ceylon: At elevation of 6,000 feet.
Denmark: Brahetrolleborg, Häsede, Hindsgavl, Knuthenborg, Langdal plantation, Langesoe, Ravnholt, Sölestedgaard.
Finland: Tammisto.
France: Barbier nurseries, Barres, Côtes, Fremont, Harcourt, Limoges, Maulévrie, Mt. Aigoual, Nouan, Rennes Botanic Garden, Trianon (Ecole d'Horticulture), Vilmorin.
Germany: Augsburg, Barnstorf, Cologne, Cronberg, Dilborn, Eisenach, Falkenstein, Gadow, Hardburg a. d. Elbe, Heidelberg, Hohen-Niendorf, Kattmannskamp (groups, mixtures), Lindau, Lousberg Villa, Magdeburg, Muskau, Passau, Pförten, Prussia, Ralswiek, Riddagshausen, Scharfenberg, Schlemmin, Schleswig-Holstein, Tannenhöft, Tharandt, Trier, Weinheim, Wendisch-Wilmersdorf, Wissen, Wörlitz.
Luxembourg.
Netherlands: Arnhem, Het Loo, Schovenhorst.
New Zealand: Wellington.
Norway: Söfteland, south of Bergen.
Poland: Danzig, Freienhuben, Glogau, Königsberg, Oliva.
Portugal: Montserrate.

Sweden: Alnarp, Jönköping.
Switzerland: Lucerne.

Acacia farnesiana (L.) Willd. **sweet acacia**

Australia: Rather widely distributed.
Cyprus: Grows well on various soils.
India: Common in moderately dry regions.
Palestine: Widely grown as hedge and windbreak.

Acer circinatum Pursh **vine maple**

Austria: Vienna.
British Isles: Nymans.
Denmark: Copenhagen, Hardenberg.
France: Barres, Maulévrie, Strasbourg.
Germany: Dörenthe, Grafrath, Hamburg Botanic Garden, Lousberg Villa, Magdeburg.
Portugal: Bussaco.
Russia: Ukraine.

Acer glabrum Torr. **Rocky Mountain maple**

France: Barbier nurseries.
Germany: Lousberg Villa.

Acer glabrum var. **douglasii** (Hook.) Dipp. **Douglas maple**

Denmark: Copenhagen Botanic Garden.
Germany: Augsburg, Tannenhöft.

Acer grandidentatum Nutt. **bigtooth maple**

Germany: Darmstadt Botanic Garden.
Poland: Königsberg.

Acer leucoderme Small **chalk maple**

France: Barres.

Acer macrophyllum Pursh **bigleaf maple**

Austria: Vienna.
Belgium: Tervueren.
British Isles: Uncommon. A few large trees. Cluny, Colesborne.
Denmark: Copenhagen, Hardenberg.
Finland: Tammisto.
France: Barres, Bois de Boulogne, Bretagne, Champeaux, Harcourt, Limoges, Maulevrie, Metz, Montpellier, Trianon (Ecole d'Horticulture).
Germany: Aachen, Augsburg, Darmstadt Botanic Garden, Hamburg Botanic Garden, Lousberg Villa, Weinheim, Wendisch-Wilmersdorf.
Netherlands: Arnhem.
Poland: Königsberg.
Sweden: Lund.

Acer negundo L. **boxelder**

Argentina.
Austria.
Belgium: Gedinne, Laeken (Royal Park), Louvain.
British Isles: Long grown as ornamental. Cluny, Colesborne, London, Nymans.
Bulgaria.
Czechoslovakia.

Denmark: Copenhagen, Ravnholt.
Estonia: Tartu.
France: Barres, Montpellier, Pézanin, Prafrance, Versailles.
Germany: Altona, Augsburg, Bavaria (530 trees), Berlin, Cannstatt, Cologne City Garden, Frankfurt a. Main, Gadow, Grambow, Hambach, Heidelberg City Forest, Hohenheim, Karlsruhe, Magdeburg, Mainau Island, Münster, Muskau, Nürnberg, Potsdam, Prussia, Seebach, Sophienhof, Tannenhöft, Teltow, Trier, Wiesbaden, Wilhelma.
Italy: Villa Barbo (Lac Majeur).
Japan: Asakawa.
Lativia: Riga.
Netherlands: Wageningen.
Palestine.
Poland: Beuthen, Danzig, Gleiwitz, Glogau, Königsberg.
Portugal: Bussaco.
Russia: Bryansk region, Ukraine.
South Africa.
Sweden: Lund.
Switzerland: Zurich.

Acer nigrum Michx. **black maple**

Austria: Vienna.
France: Barres, St. Mandé.
Germany: Augsburg, Barnstorf, Giessen, Lousberg Villa, Tannenhöft.
Poland: Königsberg.

Acer pensylvanicum L. **striped maple**

Austria: Vienna.
Belgium: Tervueren.
British Isles: Nymans.
France: Barres, Bois de Boulogne, Harcourt, Limoges, Maulévrie, Pézanin, St. Mandé, Trianon (Ecole d'Horticulture).
Germany: Augsburg, Berlin, Dyck, Eisenach, Fürstlich Drehna, Hamburg Botanic Garden, Heidelberg City Forest, Karlsruhe, Lousberg Villa, Magdeburg, Mainau Island, Tannenhöft.
Netherlands.
Poland: Danzig.
Russia: Bryansk region, Ukraine.
Sweden: Lund.

Acer rubrum L. **red maple**

Austria: Linz.
Belgium: Gedinne, Lanklaer, Tervueren.
British Isles: Bagshot, London.
France: Barres, Bois de Boulogne, Catros, Champeaux, Maulévrie, Morlaix, Mt. Aigoual, Trianon (Ecole d' Horticulture).
Germany: Altona, Augsburg, Barnstorf, Buddenhagen, Cleve, Cologne City Forest, Destedt Park, Eisenach, Hamburg Botanic Garden, Heidelberg City Forest, Lousberg Villa, Magdeburg, Mainau Island, Mettlach, Muskau, Nürnberg, Tannenhöft.
Hungary.
Latvia: Riga.
Netherlands: Arnhem.
Poland: Königsberg.

Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Bryansk region, Ukraine.
Sweden: Lund.
Switzerland: Zurich.

Acer saccharinum L. **silver maple**

Austria: Planted in state and communal forests. Two areas with a total of 500 trees.
Belgium: Cedrogne, Gedinne, Groenendael, Hertogenwald, Laeken (Royal Park), Louvain, Nassogne, St. Michel (plantations), Tervueren.
British Isles: Much planted as an ornamental. Curraghmore, Nymans.
Denmark: Aalholm.
Finland: Tammisto.
France: Barbier nurseries, Barres, Brest Marine Gardens, Caën, Champeaux, Cherbourg (several parks), Fosse, Geneste City Park, Harcourt, Limoges, Metz, Morlaix, Mouillefert, Mt. Aigoual, Pézanin, Prafrance, Rennes, St. Mandé, Strasbourg, Trianon (Ecole d'Horticulture).
Germany: Aachen, Altona, Augsburg, Barnstorf, Buddenhagen, Cannstatt, Cleve, Cologne, Dahlem, Falkenstein, Frankfurt a. Main, Fürstlich Drehna, Gadow, Hamburg Botanic Garden, Heidelberg City Forest, Hohenheim, Hohen-Niendorf, Kalkhorst, Kromlau, Lousberg Villa, Magdeburg, Mettlach, Muskau, Nürnberg, Passau, Prussia, Ralswiek, Reinhardtsbrunn, Riddagshausen, Rosenstein Park, Scharfenberg, Schwerin, Sophienhof, Tannenhöft, Teltow, Weimar, Weinheim, Wendisch-Wilmersdorf.
Hungary.
Latvia: Riga.
Japan.
Netherlands: Arnhem, Landfort.
Poland: Beuthen, Danzig, Gleiwitz, Glogau, Gosda, Königsberg.
Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Bryansk region, Ukraine.
Sweden: Lund.
Switzerland: Wabern, Zurich.

Acer saccharum Marsh. **sugar maple**

Austria: Vienna; also two areas (500 trees), locations unknown.
Belgium: Cedrogne, Groenendael, Nassogne, St. Michel (plantations).
British Isles: Nymans. A few large trees. Rarely thrives in England.
Denmark: Hardenberg.
Finland: Tammisto.
France: Barres, Vilmorin.
Germany: Augsburg, Bavaria, Berlin, Bishofswalde, Buddenhagen, Darmstadt Botanic Garden, Destedt Park, Dyck, Frankfurt a. Main, Grafrath, Hamburg Botanic Garden, Heidelberg City Forest, Hohenheim, Karlsruhe, Magdeburg, Passau, Reinhardtsbrunn, Rosenstein Park, Sophienhof (150 trees), Tannenhöft, Weinheim.
Netherlands.
Poland: Allenstein, Königsberg.
Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Ukraine.

Acer spicatum Lam. — **mountain maple**

British Isles: Tubney.
Finland: Tammisto.
France: Barres.
Germany: Lousberg Villa, Magdeburg, Nürnberg, Wernigerode.
Poland: Königsberg.
Russia: Bryansk region.

Aesculus arguta Buckl. — **Texas buckeye**

France: Barres.

Aesculus californica (Spach) Nutt. — **California buckeye**

British Isles: Bath Botanic Garden, Nymans.
France: Barres.
Germany: Scharfenberg.

Aesculus glabra Willd. — **Ohio buckeye**

British Isles: Seems to be rare.
France: Barres.
Germany: Cannstatt, Cleve, Hamburg Botanic Garden, Schwerin, Teltow.

Aesculus octandra Marsh. — **yellow buckeye**

British Isles: Charlton Kings, Nymans.
Denmark: Holstenhuus, Ravnholt.
France: Barres, Vilmorin.
Germany: Cologne City Forest, Kalkhorst, Lindau, Ludwigslust, Magdeburg, Münster, Nürnberg, Potsdam, Weinheim.
Netherlands: Het Loo.
Poland: Sagan.
Romania: Hatarmajor.
Russia: Bryansk region.
Switzerland: Zurich.

Aesculus parviflora Walter. — **bottlebrush buckeye**

British Isles: Nymans.
France: Barres.
Germany: Braunfels (Solmsschen Park), Cleve, Cologne Botanic Garden, Frankfurt a. Main, Hamburg Botanic Garden, Lindau, Lousberg Villa, Magdeburg, Mainau Island, Muskau, Nürnberg, Riddagshausen.
Switzerland: Constance, Marienberg.

Aesculus pavia L. — **red buckeye**

British Isles: Kew.
France: Vilmorin.
Romania: Hatarmajor.

Aesculus pavia var. **humilis** (Lindl.) Mouillefert — **ground red buckeye**

France: Barres.

Aesculus sylvatica Bartr — **painted buckeye**

France: Metz.

Alnus crispa (Ait.) Pursh — **American green alder**

France: Barres.

Alnus maritima (Marsh.) Muhl. **seaside alder**
British Isles: Kew.

Alnus rhombifolia Nutt. **white alder**
Belgium: Tervueren.
British Isles: Aldenham.
Germany: Darmstadt, Lousberg Villa.

Alnus rubra Bong. **red alder**
Belgium: Tervueren.
British Isles: Colesborne, Kew.
France: Barres.
Germany: Augsburg, Giessen, Weinheim.
Netherlands: Wageningen.

Alnus rugosa (Du Roi) Spreng. **speckled alder**
France: Barres.

Alnus sinuata (Reg.) Rydb. **Sitka alder**
Germany: Darmstadt Botanic Garden.

Alnus tenuifolia Nutt. **thinleaf alder**
British Isles: Kew.
Germany: Darmstadt.

Amelanchier alnifolia (Nutt.) Nutt. **saskatoon serviceberry**
Germany: Weinheim.
Poland: Königsberg.

Amelanchier arborea (Michx. f.) Fern. **downy serviceberry**
British Isles: New Forest, Nymans.
Denmark: Holstenhuus.
France: Barres, Caën, Metz, Vilmorin.
Germany: Augsburg, Buddenhagen, Dammerutz, Hohenheim, Nürnberg.
Netherlands: Arnhem.
Poland: Gleiwitz.

Amelanchier canadensis (L.) Med. **serviceberry**
France: Barres.

Amelanchier florida Lindl. **Pacific serviceberry**
France: Barres.

Amelanchier laevis Wieg. **Allegheny serviceberry**
France: Barres.
Germany: Dörenthe.

Amelanchier sanguinea (Pursh) DC. **roundleaf serviceberry**
France: Barres.

Amelanchier stolonifera Wieg. **running serviceberry**
France: Barres.

Amelanchier utahensis Koehne **Utah serviceberry**
Germany: Wendisch-Wilmersdorf.

Amorpha californica Nutt. **California amorpha**
France: Barres.

Amorpha canescens Pursh — **leadplant**
British Isles: Nymans.
France: Barres, Vilmorin.

Amorpha fruticosa L. — **indigobush**
France: Barres, Vilmorin.
Germany: Cologne.
Russia: Bryansk region.

Amorpha fruticosa var. **tennessensis** (Shuttlew.) E. J. Palmer — **Tennessee indigobush**
France: Barres.

Amorpha nana Nutt. — **dwarf-indigo**
France: Barres.

Ampelopsis cordata Michx. — **heartleaf ampelopsis**
France: Barres.

Andrachne phyllanthoides (Nutt.) Muell. Arg. — ———
Germany: Darmstadt Botanic Garden.

Anisacanthus wrightii (Torr.) A. Gray — **Wright's anisacanth**
British Isles: Nymans.

Aralia hispida Vent. — **bristly aralia**
France: Barres.

Aralia nudicaulis L. — **wild-sarsaparilla**
France: Barres.

Aralia spinosa L. — **devils-walkingstick**
France: Barres, Vilmorin.

Arbutus menziesii Pursh — **Pacific madrone**
British Isles: Rather rare in England and Scotland. Bayfordbury, Nymans, Tortworth.
France: Maulévrie.
Germany: Weinheim.

Arctostaphylos manzanita Parry — **big manzanita**
British Isles: England, location unknown.

Arctostaphylos nevadensis A. Gray — **pinemat manzanita**
Germany: Cronberg.

Arctostaphylos pungens H. B. K. — **pointleaf manzanita**
British Isles: Nymans.
France: Vilmorin.

Aristolochia durior Hill — **common Dutchmans-pipe**
France: Barres, Vilmorin.
Romania: Hatarmajor.

Aristolochia tomentosa Sims — **wooly Dutchmans-pipe**
France: Barres, Vilmorin.

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Aronia arbutifolia (L.) Pers. **red chokeberry**

British Isles: Nymans.
France: Barres, Pézanin, Vilmorin.
Germany: Hamburg Botanic Garden, Muskau, Scharfenberg.
Latvia: Riga.

Aronia melanocarpa (Michx.) Elliott **black chokeberry**

British Isles: Nymans.
France: Barres, Pézanin.
Germany: Hamburg Botanic Garden, Muskau, Scharfenberg.
Poland: Königsberg.

Artemisia tridentata Nutt. **big sagebrush**

Germany: Darmstadt Botanic Garden.

Arundinaria gigantea (Walt.) Muhl. **giant cane**

France: Barres.

Asimina triloba (L.) Dunal **pawpaw**

British Isles: Nymans.
France: Barres, Maulévrie, Metz, Montpellier, Strasbourg, Trianon (Ecole d'Horticulture).
Germany: Darmstadt Botanic Garden, Dörenthe, Giessen, Karlsruhe, Potsdam.
Italy: Isola Bella (region of Lac Majeur).
Japan: Asakawa.

Atriplex canescens James **fourwing saltbush**

France: Barres.
Germany: Darmstadt Botanic Garden.

Baccharis halimifolia L. **eastern baccharis**

France: Vilmorin.
Romania: Hatarmajor.

Berberis canadensis Miller **Allegany barberry**

Denmark.
France: Barres.

Betula alleghaniensis Britton **yellow birch**

Belgium: Gedinne, Lanklaer, Sept-Fontaines, Tervueren.
British Isles: Not common.
Finland: Pekola, Tammisto.
France: Barbier nurseries, Barres, Champeaux, Metz.
Germany: Augsburg, Bonn Botanic Garden, Buddenhagen, Cronberg, Darmstadt Botanic Garden, Eberswalde (group and mixed stands), Grafrath, Heidelberg City Forest, Kattmannskamp (groups, mixtures), Lousberg Villa, Muskau, Passau, Pförten, Prussia, Riddagshausen, Sophienhof Tannenhöft, Tübingen, Weimar, Weinheim.
Japan: Asakawa.
Poland: Königsberg.
Russia: Bryansk region.

Betula ×caerulea Blanchard **blueleaf birch**

Germany: Darmstadt Botanic Garden.

Betula glandulosa Michx. **bog birch**

France: Barres.

Betula lenta L. **sweet birch**

Austria: Vienna.
Belgium: Cedrogne, Gedinne, Lanklaer, St. Michel, Tervueren.
British Isles: Kew, Tubney.
Finland: Tammisto.
France: Barres, Champeaux, Champenoux, Geneste City Park, Harcourt.
Germany: Augsburg, Buddenhagen, Darmstadt Botanic Gardens, Giessen, Grafrath, Hambach, Hohenheim, Magdeburg, Muskau, Prussia, Sophienhof, Weimar, Wernigerode.
Latvia: Riga.
Norway.
Poland: Allenstein, Königsberg.
Russia: Bryansk region.

Betula nigra L. **river birch**

British Isles: Kew, Nymans, Tortworth.
Denmark: Copenhagen.
France: Barres, Pézanin.
Germany: Bonn Botanic Garden, Cologne, Darmstadt Botanic Garden, Fürstlich Drehna, Grevenbroich, Lousberg Villa, Magdeburg, Muskau, Scharfenberg, Sophienhof.
Poland: Beuthen, Königsberg.

Betula occidentalis Hook. **water birch**

Belgium: Tervueren.
British Isles: Kew, Tortworth.
France: Vilmorin.
Germany: Darmstadt Botanic Garden.

Betula papyrifera Marsh. **paper birch**

Belgium: Two areas (900 trees, location unknown) in state and communal forests. Campine, Cedrogne, Gedinne, Lanklaer, Nassogne, St. Michel, Tervueren.
British Isles: Bicton, Cirencester, Colesborne, Kew (rare), Nymans, Tubney.
Denmark: Aalholm, Häsede.
Finland: Pekola, Tammisto.
France: Barres, Bois de Boulogne, Metz.
Germany: Augsburg, Bonn Botanic Garden, Buddenhagen, Cronberg, Darmstadt Botanic Garden, Destedt Park, Dyck, Falkenstein, Lousberg Villa, Mainau Island, Muskau, Pförten, Pillnitz, Riddagshausen, Seebach, Sophienhof, Tannenhöft, Teltow, Tübingen.
Latvia: Riga.
Poland: Beuthen, Danzig, Freienhuben, Königsberg.
Portugal: Forest of Choupat.
Russia: Bryansk region.
Spain: Madrid.
Switzerland: Zurich.

Betula papyrifera var. **commutata** (Reg.) Fern. **western paper birch**

France: Barres.

Betula papyrifera var. **humilis** (Reg.) Fern. & Raup — **Alaska paper birch**

France: Barres.

Betula populifolia Marsh.

Belgium: Campine, Gedinne, Lanklaer.
British Isles: Cluny, Kew.
Finland: Pekola, Tammisto.
France: Barres, Metz, Pézanin.
Germany: Augsburg, Cologne Botanic Garden, Hohen-Niendorf, Lousberg Villa, Muskau, Tübingen.
Poland: Königsberg.

Betula pumila L. — **low birch**

France: Barres.

Bignonia capreolata L. — **crossvine**

France: Vilmorin.

Bumelia lanuginosa (Michx.) Pers. — **gum bumelia**

Germany: Darmstadt Botanic Garden, Heidelberg.

Calycanthus fertilis Walt. — **pale sweetshrub**

France: Barres.

Calycanthus floridus L. — **common sweetshrub**

Austria: Vienna.
British Isles: Nymans.
Denmark: Hindsgavl, Ravnholt.
France: Barres, Caën, Pézanin, Vilmorin.
Germany: Augsburg, Baden-Baden, Braunfels (Solmsschen Park), Cologne, Wissen.
Poland: Königsberg.
Switzerland: Zurich.

Calycanthus occidentalis Hook. & Arn. — **California sweetshrub**

British Isles: Nymans.
France: Barres, Pézanin.
Germany: Augsburg.

Campsis radicans (L.) Seemann — **trumpetcreeper**

France: Pézanin.
Germany: Frankfurt a. Main, Trier.
Sweden: Alnarp.

Carpenteria californica Torr. — **carpenteria**

British Isles: Nymans.
France: Catros, Côtes, Fosse.
Germany: Darmstadt Botanic Garden.

Carpinus caroliniana Walt. — **American hornbeam**

British Isles: Very rare. Cluny, Nymans.
France: Barres, Maulévrie, Mouillefert.
Germany: Giessen, Lousberg Villa, Muskau.
Spain: Madrid.

Carya aquatica (Michx. f.) Nutt. — **water hickory**

Belgium: Lanklaer.

Carya cordiformis (Wangenh.) K. Koch **bitternut hickory**

Austria: Vienna; also ten areas (3,900 trees) in state and communal forests.
Belgium: Cedrogne, Lanklaer, Tervueren.
British Isles: Common; hardiest and best grower, but does not appear to be used for plantation purposes. Colesborne, Glasnevin, Nymans, Tubney.
Denmark: Häsede.
France: Barres, Champeaux, Fosse, Geneste City Park, Maulévrie, Montpellier (Ecole d'Agriculture), Nouan, St. Mandé (Ecole d'Arboriculture), Strasbourg, Versailles (Petit Trianon).
Germany: Altona, Augsburg, Buddenhagen, Darmstadt Botanic Garden, Destedt Park, Frankfurt a. Main, Magdeburg, Muskau, Prussia, Rosenstein Park, Schleswig-Holstein.
Italy: Florence.
Poland: Gosda, Königsberg.
Romania: Hatarmajor.
Spain.
Switzerland: Zurich.

Carya glabra (Mill.) Sweet **pignut hickory**

Belgium: Lanklaer, Tervueren.
British Isles: Grows fairly well, but not much cultivated. Bicton, London.
Chile.
Denmark: Copenhagen Botanic Garden.
France: Baleine (old trees), Barres (forest stands), Bois de Boulogne, Champenoux, Geneste City Park, Maulévrie.
Germany: Bonn, Destedt Park, Grafrath, Hohenheim, Muskau, Potsdam, Prussia, Riddagshausen, Weinheim.
Poland: Königsberg.
Romania: Hatarmajor.

Carya illinoensis (Wangenh.) K. Koch **pecan**

Belgium: Lanklaer.
British Isles: Does not grow well in England. Tortworth, Tubney.
France: Does not grow well in France. Barres, Catros, Fosse, Geneste City Park, Maulévrie, Montpellier, Mouillefert, Mt. Aigoual, Nimes, Pézanin, Rennes, Trianon (Ecole d'Horticulture).
Germany: Darmstadt Botanic Garden, Frankfurt a. Main, Karlsruhe, Nürnberg.
Italy: Palermo.
Portugal: Coimbre.
Romania: Hatarmajor.
Russia: Grows well if irrigated and cared for. Turkmenistan, Uzbekistan.
South Africa: Does well on good deep soils with good water supply.
Spain.

Carya laciniosa (Michx. f.) Loud. **shellbark hickory**

Belgium: Lanklaer.
British Isles: Very rare. Tortworth.
Chile.
France: Barres, Champeaux, Fosse, Geneste City Park, Maulévrie, Mouillefert, Pézanin, Strasbourg.
Germany: Darmstadt Botanic Garden, Karlsruhe, Prussia, Sophienhof.
Poland: Oliva.
Romania: Hatarmajor.

Carya myristicaeformis (Michx. f.) Nutt. **nutmeg hickory**

France: Barres, Villa Thuret (Nice).

Carya ovata (Mill.) K. Koch **shagbark hickory**

Austria: Linz; also seven areas (3,900 trees) in state and communal forests.
Belgium: Cedrogne, Lanklaer, Louvain, St. Michel (plantations), Tervueren.
British Isles: Not common. Bicton, Colesborne, Nymans, Tubney.
Chile.
Denmark: Häsede, Ravnholt.
France: Baleine (old trees), Barres (forest stands), Bois de Boulogne, Champeaux, Fosse, Maulévrie, Mouillefert.
Germany: Augsburg, Baden-Baden, Bavaria (1,700 trees in state forests), Bonn, Buddenhagen, Darmstadt Botanic Garden, Dörenthe, Eisenach, Erfurt Forest, Erlangen, Gadow, Gracht, Grafrath, Hambach, Heidelberg City Forest, Hohenheim, Hohen-Niendorf, Karlsruhe, Lindau, Ludwigslust, Mainau Island, Muskau, Nürnberg, Potsdam, Prussia, Riddagshausen, Rosenstein Park, Schwerin, Sophienhof, Tübingen, Weinheim.
Japan: Asakawa.
Latvia: Riga.
Netherlands: Arnhem.
Poland: Allenstein, Danzig, Oliva.
Portugal: Bussaco, Cintra-Pena (one of richest tree collections in Europe).
Romania: Hatarmajor.

Carya tomentosa Nutt. **mockernut hickory**

Austria: Vienna.
Belgium: Ichteghem, Lanklaer, Tervueren.
British Isles: Not uncommon as ornamental, but not used for plantations. Nymans, Tortworth.
France: Caën, Fosse, Geneste City Park, Mt. Aigoual.
Germany: Augsburg, Bavaria (groups), Cleve, Dahlem, Grafrath, Muskau, Prussia, Schleswig-Holstein, Wörlitz.
Poland: Glogau, Königsberg.
Romania: Hatarmajor.
South Africa.

Cassiope tetragona (L.) D. Don **firemass cassiope**

British Isles: Nymans.

Castanea dentata (Marsh.) Borkh. **American chestnut**

Belgium: Tervueren.
British Isles: Cluny.
Germany: Baden-Baden, Grafrath, Pförten.
Romania: Hatarmajor.
Spain.

Castanea pumila Mill. **Allegheny chinkapin**

British Isles: Very few grown.
France: Maulévrie, Pézanin, Vilmorin.
Romania: Hatarmajor.

Castanopsis chrysophylla (Dougl.) A. DC. **golden chinkapin**

British Isles· Unusual. Kew, Nymans, Tortworth.

Catalpa bignonioides Walt. **southern catalpa**

British Isles: Scattered. Frequently cultivated for ornament. Cardiff Castle, London, Nymans.
Denmark: Hardenberg, Knuthenborg.
France: Barres, Bois de Boulogne, Campeaux, Colmar, Maulévrie, Vilmorin.
Germany: Augsburg, Braunfels, Cannstatt, Cleve, Cologne City Forest, Frankfurt a. Oder, Fürstlich Drehna, Heidelberg, Hohenheim, Karlsruhe, Kattmannskamp (groups, mixtures), Kromlau, Lindau, Lousberg Villa, Magdeburg, Mettlach, Nürnberg, Potsdam, Scnwerin, Trier, Wörlitz.
Palestine: Acre, Jerusalem.
Poland: Beuthen.
Portugal: Bussaco.
Romania: Hatarmajor.
South Africa: Tried in arboretum plots; not promising.
Switzerland: Marienberg, Zurich.

Catalpa speciosa Warder **northern catalpa**

Austria: Vienna.
Belgium: Louvain.
British Isles: Frequently tried in England but has shown no sign of becoming a useful timber tree. Nymans, Totten House, Tubney.
France: Barres, Champeaux, Maulévrie, Versailles (Petit Trianon), Villa Thuret (Nice), Vilmorin.
Germany: Altona, Augsburg, Cologne, Cronberg, Darmstadt Botanic Garden, Dörenthe, Gadow, Heidelberg City Forest, Kalkhorst, Karlsruhe, Prussia, Riddagshausen, Sophienhof, Weinheim, Wissen.
Japan: Asakawa.
Netherlands: Landfort.
Palestine: Acre, Jerusalem.
Poland: Glogau.
Portugal: Forest of Choupat.
Romania: Hatarmajor.
Russia: Bryansk region.
Ryukyu Islands.
South Africa: Tried in aboretum plots; not promising.

Ceanothus americanus L. **Jerseytea**

British Isles: Nymans.
Poland: Gleiwitz, Glogau.

Ceanothus ×delilianus Spach **Delisle ceanothus**

France: Barres.

Ceanothus fendleri A. Gray **Fendler ceanothus**

France: Barres, St. Mandé (Ecole d'Arboriculture).
Poland: Glogau, Königsberg.

Ceanothus ovatus Desf. **inland ceanothus**

France: Barres.

Ceanothus ×pallidus Lindl. **pallidus ceanothus**

France: Barres.

Ceanothus thyrsiflorus Eschsch. **blueblossom**

British Isles: Nymans.

Ceanothus velutinus Dougl. **snowbrush**

Germany: Weinheim.

Celastrus scandens L. **American bittersweet**

British Isles: Nymans.
France: Vilmorin.
Germany: Scharfenberg (planted close in mixtures)
Poland: Königsberg.
Russia: Bryansk region.

Celtis laevigata Willd. **sugarberry**

British Isles: Kew.
France: Barres.

Celtis occidentalis L. **hackberry**

Belgium: Louvain.
British Isles: Occasionally cultivated but rare, although it stands the climate better than other species of *Celtis*. Kew, London, Nymans, Tubney.
France: Antibes, Barres, Colmar City Park, Geneste City Park, Maulévrie, Montpellier, Mt. Aigoual, Nimes, Prafrance, Toulon, Vilmorin.
Germany: Aachen, Cannstatt, Cologne, Destedt Park, Hamburg Botanic Garden, Karlsruhe, Lindau, Lousberg Villa, Magdeburg, Mainau Island, Munster, Potsdam, Teltow, Tübingen, Weinheim, Wendisch-Wilmersdorf.
Italy: Padua, one large tree.
Netherlands: Wageningen.
Palestine: Jerusalem.
Poland: Danzig, Freienhuben, Glogau, Königsberg, Oliva.
Romania: Hatarmajor.
Russia: Ukraine.
South Africa: Tried, but slow growing; location unknown.
Spain: Madrid (trees largely same as at Paris).
Switzerland: Zurich.

Celtis reticulata Torr. **netleaf hackberry**

France: Barres.
Germany: Darmstadt Botanic Garden.

Celtis tenuifolia Nutt. **Georgia hackberry**

France: Barres.

Cephalanthus occidentalis L. **common buttonbush**

British Isles: Nymans.
France: Barres.
Germany: Augsburg.
Poland: Glogau.

Cercis canadensis L. **eastern redbud**

Austria: Vienna.
France: Barres, Strasbourg, Vilmorin.
Germany: Aachen, Augsburg, Braunfels, Dörenthe, Hamburg Botanic Garden, Karlsruhe, Lousberg Villa, Potsdam.
Japan.
Netherlands: Wageningen.
Poland: Glogau.
Romania: Hatarmajor.
Switzerland: Zurich.

Cercis occidentalis Torr. **California redbud**

Germany: Darmstadt Botanic Garden.

Cercocarpus argenteus Rydb. **silver cercocarpus**

Germany: Darmstadt Botanic Garden.

Cercocarpus betuloides Nutt. **birchleaf cercocarpus**

France: Barres.

Cercocarpus montanus Raf. **mountain cercocarpus ("mountain mahogany")**

France: Barres, Vilmorin.

Germany: Darmstadt Botanic Garden.

Chamaebatiaria millefolium (Torr.) Maxim. **tansy**

British Isles: Nymans.

France: Vilmorin.

Chamaecyparis lawsoniana (A. Murr.) Parl. **Port-Orford-cedar**

Austria: Linz. Also 46 areas (16,400 trees) planted in state and communal forests.

Belgium: Ardennes, Beernem (roadside), Capucins, Gedinne, Grand Bois, Groenhove, Lanklaer, Nassogne, Raevels, St. Michel, Sept-Fontaines, Soignes Forest, Three Kings Park, Tervueren, Vogelsanck Park.

British Isles: Hardy. Common ornamental, limited plantations. Bagley Wood, Bedgebury, Benmore, Brahan, Cirencester, Cluny, Curraghmore, Colesborne, Dawyck, Hope Toun, Lynedoch, Murthly, Novar, Nymans, Penrhyn, Pontyclun, Tubney.

Ceylon: Successful in hilly country at 4,000–6,000 feet.

Denmark: Aalholm, Brahetrolleborg, Fuglsang, Gisselfeld, Häsede, Hindsgavl, Knuthenborg, Langesoe, Sölestedgaard.

Finland: Tammisto.

France: Barres, Champeaux, Champenoux, Fremont, Harcourt, Keranflech, Limoges, Lusse, Maulévrie, Montpellier, Mt. Aigoual, Nice, Nimes, Prafrance, Rennes, Sénéclauze Estate, Vilmorin.

Germany: Aachen, Altona, Augsburg, Baden-Baden, Badenweiler, Barnstorf, Bavaria (state forests had 139,000), Braunfels, Cleve, Dahlem, Eberswalde, Erfurt Forest, Freienwalde a. Oder, Fürstlich Drehna, Gadow, Grafrath, Haag Park, Harburg a. d. Elbe, Harzburg (forest test plots), Heidelberg City Forest, Hohenheim, Hohen-Niendorf, Ilten, Kaartz, Kalkhorst, Karlsruhe, Lindau, Lousberg Villa, Mainau Island, Münster, Muskau, Passau, Pförten, Pillnitz, Prussia, Putbus, Riddagshausen, Röttgen, Scharfenberg, Schleswig-Holstein, Schwerin, Seebach, Sophienhof, Spessart, Tannenhoft, Tharandt, Trier, Weimar, Weinheim, Wendisch-Wilmersdorf, Wiesbaden, Wörlitz Park.

India.

Italy: Apennine mountains, Florence, Lac Majeur region.

Japan: Asakawa.

Kenya: Grows in the highlands.

Latvia: Riga.

Netherlands: Arnhem, Het Loo, Schovenhorst.

New Zealand: Successful at 200 to 1,500 feet in areas of no drought and no strong winds. Erua State Forest (1,100 acres), Hanmer Springs.

Poland: Allenstein, Danzig, Freienhuben, Gleiwitz, Glogau, Königsberg, Oliva.

Portugal: Bussaco, Coimbre.
Romania: Hatarmajor.
South Africa: Single trees, a few arboretum plots; growth raipd in some areas; hardy. Frankenwald (Transvaal), 250 hectares.
Spain: Madrid (trees largely same as at Paris).
Sweden: Alnarp, Jönköping.
Switzerland: Constance, Lausanne, Lucerne Marienberg, Zurich.
Yugoslavia.

Chamaecyparis nootkatensis (D. Don) Spach **Alaska-cedar**

Belgium: The best conditions are found in lower Belgium. Gedinne, St. Michel, Tervueren, Vogelsanck Park.
British Isles: One of the finest shipbuilding timbers of the world. Elwes planted 10,000 trees on his estate (Colesborne). Bagley wood, Bedgebury, Brahan, Cirencester, Cluny, Colesborne, Curraghmore, Dawyck, Eastnor Castle, Hope Toun, Murthly, Neath, Nymans, Penrhyn, Tubney.
Denmark: Brahetrolleborg, Knuthenborg, Ravnholt.
France: Barres, Champenoux, Colmar City Park, Fremont, Harcourt, Limoges, Maulévrie, Montpellier, Mt. Aigoual, Nice, Rennes, Sénéclauze Estate, Vilmorin.
Germany: Altona, Augsburg, Baden-Baden, Badenweiler, Cleve, Cologne, Dilborn, Dörenthe, Eisenach, Erlangen, Falkenstein, Frankfurt a. Oder, Grafrath, Harbke Park, Heidelberg City Forest, Hohenheim, Hohen-Niendorf, Kaartz, Kalkhorst, Karlsruhe, Kromlau, Lindau, Lousberg Villa, Magdeburg, Mainau Island, Muskau, Nürnberg, Pillnitz, Schleswig-Holstein, Schwerin, Seebach, Trier, Türnich, Weinheim Wendisch-Wilmersdorf, Wernigerode, Wilhelma, Wörlitz Park.
India.
Italy: Villa Barbo (region of Lac Majeur).
Latvia: Riga.
Netherlands: Schovenhorst.
Norway: Söfteland, south of Bergen.
Poland: Danzig, Freienhuben, Glogau, Oliva.
Sweden: Jönköping.
Switzerland: Constance, Lucerne, Marienberg, Zurich.

Chamaecyparis thyoides (L.) B. S. P. **Atlantic white-cedar**

Belgium: St. Michel.
British Isles: Has no forest value in Britain. Bedgebury, Kew, Nymans.
Denmark: Brahetrolleborg.
France: Barres, Pézanin, Vilmorin.
Germany: Grevenbroich, Scharfenberg, Tharandt, Weinheim.
India.
Italy: Villa Barbo (Lac Majeur region).

Chimaphila maculata (L.) Pursh **striped pipsissewa**

British Isles: Nymans.

Chionanthus virginicus L. **fringetree**

Austria: Altmunster, Vienna.
France: Barres, Catros, Champeaux, Maulévrie, Vilmorin.
Germany: Augsburg, Braunfels, Cologne Botanic Garden, Dahlem, Dörenthe, Hamburg Botanic Garden, Karlsruhe, Weinheim, Wörlitz.

Poland: Glogau.
Romania: Hatarmajor.
Sweden: Alnarp.

Chrysothamnus viscidiflorus (Hook.) Nutt. **Douglas rabbitbrush**

British Isles: Nymans.

Cladrastis lutea (Michx. f.) K. Koch **yellowwood**

Belgium: Court-Saint-Etienne.
British Isles: Colesborne, Highclere, Kew, Nymans, Syon, Tubney.
France: Barres, Bois de Boulogne, Fremont, Montpellier (Ecole d'Agriculture), Morlaix, Mt. Aigoual, Nantes Botanic Garden, Rennes, Sénéclauze Estate, Strasbourg, Vilmorin.
Germany: Aachen, Augsburg, Baden-Baden, Cologne, Destedt Park, Frens, Hamburg Botanic Garden, Karlsruhe, Lousberg Villa, Ludwigslust, Magdeburg, Münster, Nürnberg, Riddagshausen, Scharfenberg, Tübingen, Weinheim, Wiesbaden, Wörlitz.
Poland: Gosda.

Clematis crispa L. **curly clematis**

France: Barres.

Clematis fremontii S. Wats. **Fremont clematis**

France: Barres.

Clematis ligusticifolia Nutt. **western virginsbower**

France: Barres, Vilmorin.

Clematis ochroleuca Ait. **chrome clematis**

France: Barres.

Clematis pitcheri Torr. & Gray **Pitcher clematis**

France: Barres.

Clematis texensis Buckl. **scarlet clematis**

France: Barres.

Clematis virginiana L. **virginsbower**

France: Barres.
Romania: Hatarmajor.

Clethra acuminata Michx. **cinnamon clethra**

France: Barres, Vilmorin.
Germany: Muskau.

Clethra alnifolia L. **summersweet clethra**

British Isles: Nymans.
France: Barres, Caën, Vilmorin.
Germany: Cleve, Cronberg, Wendisch-Wilmersdorf (in park).
Latvia: Riga.
Poland: Gleiwitz.
Romania: Hatarmajor.

Clethra tomentosa Lam. **woolly clethra**

France: Barres.

Cocculus carolinus (L.) DC. — **Carolina snailseed**

British Isles: Nymans.
France: Barres.
Germany: Darmstadt Botanic Garden.

Comptonia peregrina (L.) Coult. — **sweetfern**

Austria: Vienna.
British Isles: Nymans.
France: Barres.
Germany: Cronberg, Dörenthe, Muskau, Scharfenberg.
Netherlands: Wageningen.
Romania: Hatarmajor.

Cornus alternifolia L. f. — **alternate-leaf dogwood**

Austria: Vienna.
Germany: Hamburg Botanic Garden, Münster, Scharfenberg.

Cornus alternifolia var. **argentea** Temple — **silverleaf dogwood**

France: Barres.

Cornus amomum Miller — **silky dogwood**

France: Barres.

Cornus asperifolia Michx. — **roughleaf dogwood**

France: Barres.

Cornus florida L. — **flowering dogwood**

British Isles: Nymans.
France: Barres, Catros, Fosse, Harcourt.
Germany: Cologne Botanic Garden, Darmstadt Botanic Garden, Destedt Park, Freiburg Botanic Garden, Hamburg Botanic Garden, Kromlau, Lousberg Villa, Mainau Island, Münster, Pförten, Wendisch-Wilmersdorff, Wörlitz.
Italy: Rovelli nurseries (region of Lac Majeur).
Netherlands: Wageningen.
Poland: Oliva.
Romania: Hatarmajor.

Cornus glabrata Benth. — **brown dogwood**

Germany: Darmstadt Botanic Garden.

Cornus nuttallii Audubon — **Pacific dogwood**

France: Barres, Catros, Fosse.

Cornus obliqua Raf. — **pale dogwood**

France: Barres.

Cornus occidentalis (Torr. & Gray) Coville — **western dogwood**

France: Barres.

Cornus racemosa Lam. — **gray dogwood**

France: Barres.
Romania: Hatarmajor

Cornus rugosa Lam. — **roundleaf dogwood**

France: Barres.

Cornus stolonifera Michx. **red-osier dogwood**

British Isles: Nymans.
France: Barres.
Germany: Augsburg, Nürnberg.
Romania: Hatarmajor.
Russia: Bryansk region.

Cornus stolonifera var. **coloradensis** (Koehne) Schneid. **Colorado red-osier dogwood**

France: Barres.

Corylus americana Marsh. **American hazel (or filbert)**

France: Barres.

Corylus cornuta Marsh. **beaked hazel (or filbert)**

France: Barres, Vilmorin.
Germany: Augsburg, Lousberg Villa, Muskau.
Russia: Bryansk region.

Corylus cornuta var. **californica** (A. DC.) Sharp. **California hazel (or filbert)**

France: Maulévrie.
Ryukyu Islands.

Cotinus obovatus Raf. **American smoketree**

British Isles: Nymans.
France: Barres.
Netherlands: Wageningen.

Cowania mexicana D. Don **cliffrose**

Germany: Darmstadt Botanic Garden.

Crataegus arnoldiana Sarg. **Arnold hawthorn**

France: Barres.

Crataegus canbyi Sarg. **Canby hawthorn**

France: Barres.

Crataegus coleae Sarg. **Cole hawthorn**

France: Barres.

Crataegus collina Chapm. **sandhill hawthorn**

France: Barres.

Crataegus crus-galli L. **cockspur hawthorn**

Belgium: Sept-Fontaines.
British Isles: Nymans.
France: Barres, Geneste City Park.
Germany: Muskau, Ralswiek.
Japan: Asakawa.
Romania: Hatarmajor.

Crataegus dilatata Sarg. ———

France: Barres.

Crataegus divida Sarg. ———

France: Barres.

Crataegus douglasii Lindl. **black hawthorn**

Germany: Lousberg Villa.

Crataegus induta Sarg. **turkey hawthorn**

France: Barres.

Crataegus mollis Scheele **downy hawthorn**

British Isles: Nymans.
France: Barres.

Crataegus nitida (Engelm.) Sarg. **glossy hawthorn**

France: Barres.

Crataegus pedicellata Sarg. **scarlet hawthorn**

British Isles: Nymans.
Denmark: Aalholm.
France: Caën, Geneste City Park.
Germany: Augsburg, Lousberg Villa, Wendisch-Wilmersdorf (in park).
Latvia: Riga.
Poland: Glogau.
Romania: Hatarmajor.

Crataegus pennsylvanica Ashe **Pennsylvania hawthorn**

France: Barres.

Crataegus phaenopyrum (L. f.) Med. **Washington hawthorn**

France: Barres.
Romania: Hatarmajor.

Crataegus punctata Jacq. **dotted hawthorn**

British Isles: Nymans.
France: Barres, Vilmorin.
Germany: Aachen, Lousberg Villa.
Sweden: Alnarp.

Crataegus submollis Sarg. **Quebec hawthorn**

British Isles: Nymans.
France: Barres.

Crataegus succulenta Schrad. **fleshy hawthorn**

Norway.

Crataegus uniflora Muenchh. **one-flower hawthorn**

France: Barres.

Crataegus viridis L. **green hawthorn**

British Isles: Nymans.

Cupressus arizonica Greene **Arizona cypress**

Austria: Vienna.
Australia: Australian Capital Territory, Queensland.
British Isles: Introduced 1880; suitable only in warmest parts of England and Ireland; no plantation value. Bagley Wood, Bedgebury, Nymans.
Cyprus.
France: Barres, Fosse, Maulévrie, Montpellier, Vilmorin.
Germany: Cronberg, Darmstadt Botanic Garden, Mainau Island.
India.

Italy: Apennine mountains.
Kenya.
Netherlands: Wageningen.
Nyasaland: Successful as individual tree and in small trial plots, chiefly over 4,000 feet. Exact locations not known.
Palestine: Acre, Jerusalem; also trial plantations.
South Africa: Location unknown; introduced 1908; hardiest cypress.
Southern Rhodesia: Locations unknown; grows best at 3,000 to 5,000 feet.
Switzerland: Lucerne.

Cupressus goveniana Gord. **Gowen cypress**

British Isles: Not common; grows only in mildest situations. Bedgebury, Nymans.
France: Barres, Maulévrie, Montpellier (Ecole d'Agriculture), Nice.
South Africa: Locations unknown; small-scale trials as ornamental and in arboretum plots.

Cupressus macnabiana A. Murr. **MacNab cypress**

British Isles: Not common.
Bedgebury Nymans.
France: Barres, Maulévrie, Montpellier (Ecole d'Agriculture).
Germany: Cologne.
Italy; Rovelli nurseries (Isola Madre, region of Lac Majeur).
Netherlands: Wageningen.

Cupressus macrocarpa Hartw. **Monterey cypress**

Australia: Australian Capital Territory, Queensland, Victoria (Ballarat Water Commission).
British Isles: Much planted for shelter and ornament in western and southern England. Bagley Wood, Bicton, Chiswick, Cluny, Colesborne, Dublin, Hope Toun, Murthly, Northerwood, Nymans, Penrhyn, Pontyclun, Tresco, Tubney.
Ceylon: Introduced about 1883; successful; plantations date from 1920.
Chile.
Cyprus: Introduced successfully on a small scale.
France: Barres, Brest, Catros, Champeaux, Cherbourg (several parks), Keranflech, Martinvast, Maulévrie, Montpellier (Ecole d'Agriculture), Morlaix, Nantes Botanic Garden, Nice, Pézanin, Prafrance, Rennes, Vilmorin.
India.
Italy.
Kenya.
New Zealand: Canterbury, Erua State Forest (14 acres), South Island.
Nyasaland: Location unknown; successful at 2,000–3,000 feet.
Palestine: Jerusalem, Acre.
Portugal: Coimbre.
Ryukyu Islands.
South Africa: Widely planted; oldest plantation about 1898.
Southern Rhodesia: Grows best at 5,000 feet; locations unknown.
Spain: Madrid.
Tanganyika: Location unknown; successful on small scale.
Uganda: Few small plantations near the lake (Victoria?).

Cyrilla racemiflora L. — **swamp cyrilla**
British Isles: Nymans.

Decumaria barbara L. — **southeast decumaria**
British Isles: Nymans.

Dendromecon rigida Benth. — **stiff bushpoppy**
British Isles: Nymans.

Diervilla lonicera Miller — **dwaft bushhoneysuckle**
France: Barres.
Germany: Augsburg.

Diervilla rivularis Gattinger — **Georgia bushhoneysuckle**
British Isles: Nymans.
France: Barres.

Diervilla sessilifolia Buckl. — **southern bushhoneysuckle**
France: Barres.

Diospyros virginiana L. — **common persimmon**
Austria: Vienna.
British Isles: Nymans.
Denmark: Charlottenlund, Copenhagen.
France: Barres, Bois de Boulogne, Catros, Champeaux, Geneste City Park, Gréve, Morlaix, Mouillefert, Nice, Nimes, Trianon (Ecole d'Horticulture), Vilmorin.
Germany: Darmstadt Botanic Garden, Hohenheim, Karlsruhe, Mainau Island, Münster, Scharfenberg.
Italy: Isola Bella (region of Lac Majeur).
Romania: Hatarmajor.
Switzerland: Zurich.

Dirca palustris L. — **Atlantic leatherwood**
British Isles: Nymans.
France: Barres, Maulévrie, Versailles (Petit Trianon).
Germany: Wendisch-Wilmersdorf.

Elaeagnus commutata Bernh. — **silverberry**
British Isles: Nymans.
Germany: Augsburg.
Russia: Bryansk region.

Euonymus americana L. — **eastern wahoo**
Germany: Cologne.

Euonymus occidentalis Nutt. — **western wahoo**
Germany: Darmstadt Botanic Garden.

Fagus grandifolia Ehrh. — **American beech**
Austria: Vienna.
Belgium: Tervueren.
British Isles: Eastnor Castle, Torworth, Tubney.
Denmark: Knuthenborg.
France: Barres, Caën, Champeaux, Geneste City Park, Maulévrie, Metz.
Germany: Augsburg, Buddenhagen, Cologne, Darmstadt Botanic Garden, Mettlach, Muskau, Weinheim.

Italy: Rovelli nurseries (region of Lac Majeur).
Netherlands: Landfort, Wageningen.
Poland: Glogau, Königsberg.

Fendlera rupicola A. Gray — **cliff fendlerbush**

Austria: Vienna.
France: Barres, Metz, St. Mandé (Ecole d'Arboriculture), Strasbourg, Vilmorin.
Germany: Darmstadt Botanic Garden.

Forestiera acuminata (Michx.) Poir. — **swamp-privet (Texas forestiera)**

Austria: Vienna.
British Isles: Nymans.
France: Barres.
Germany: Darmstadt Botanic Garden.

Forestiera ligustrina (Michx.) Poir. — **privet forestiera**

Germany: Scharfenberg.

Forestiera neomexicana A. Gray — **New Mexican forestiera**

France: Metz.

Fothergilla gardenii Murray — **dwarf fothergilla**

British Isles: Nymans.
Germany: Augsburg.
Poland: Konigsberg.

Fothergilla major (Sims) Lodd. — **large fothergilla**

British Isles: Nymans.
France: Barres.

Fraxinus americana L. — **white ash**

Austria: Locations unknown; 11 areas (3,000 trees) planted over 100 years in state and communal forests.
Australia: Wirrabara forest (south Australia).
Belgium: Cedrogne, Gedinne, Groenendael, Lanklaer, Tervueren.
British Isles: Rather uncommon; quick-growing, but not grown as forest tree. Cirencester, Colesborne, Fawley Court, Nymans, Tortworth, Tubney.
Denmark: Copenhagen.
Estonia: Tartu.
Finland: Tammisto.
France: Barres, Champenoux, Maulévrie, Mt. Aigoual, St. Mandé (Ecole d'Arboriculture), Schlumberger.
Germany: Augsburg, Bavaria (100,000 planted in state forests), Cannstatt, Cologne City Forest, Eberswalde, Eisenach, Erfurt, Giessen, Grafrath, Hambach, Hamburg Botanic Garden, Hohen-Niendorf, Lindau, Lousberg Villa, Münster, Muskau, Prussia, Rosenstein Park, Scharfenberg, Schleswig-Holstein, Schwerin, Sophienhof, Teltow, Weinheim, Wendisch-Wilmersdorf, Wilhelma.
Hungary.
Latvia: Riga.
Netherlands: Landfort.
Palestine: Acre.
Poland: Beuthen, Danzig, Freienhuben, Königsberg, Prussia.

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Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Bryansk region.
South Africa: Frankenwald (Transvaal); successful as ornamental.
Spain: Madrid.
Switzerland: Lausanne.
Yugoslavia: Croatia.

Fraxinus anomala Torr. **singleleaf ash**

British Isles: Kew.
Germany: Darmstadt Botanic Garden.

Fraxinus berlandieriana A. DC. **Berlandier ash**

France: Barres.

Fraxinus caroliniana Mill. **Carolina ash**

British Isles: Kew.
Finland: Pekola (forest).
France: Maulévrie, Mt. Aigoual.
Germany: Augsburg, Coesfelder Berg (forest plantings), Cologne Botanic Garden, Giessen, Muskau.
Latvia: Riga.
Poland: Allenstein, Gosda, Königsberg.
Russia: Bryansk region.

Fraxinus cuspidata Torr. **fragrant ash**

France: Barres.

Fraxinus latifolia Benth. **Oregon ash**

Belgium: Geddinne, Lanklaer, Tervueren.
British Isles: Colesborne, Tortworth, Tubney.
Denmark: Copenhagen.
France: Barres, Maulévrie, Mt. Aigoual.
Germany: Augsburg, Lousberg Villa.

Fraxinus nigra Marsh. **black ash**

Austria: 1 area (130 trees); location unknown.
Belgium: Tervueren.
British Isles: Kew, Cluny.
France: Barres, Maulévrie.

Fraxinus pennsylvanica Marsh. **green ash**

Belgium: Gedinne, Tervueren.
British Isles: Common but known only as ornamental. Colesborne, Nymans. Tubney.
Finland: Tammisto.
France: Barres, Champeaux, Maulévrie, Trianon (Ecole d'Horticulture).
Germany: Altona, Cannstatt, Cologne, Destedt Park, Fürstlich Drehna, Gadow, Hambach, Schwerin.
Poland: Glogau.
Romania: Hatarmajor.
Russia: Ukraine.
South Africa: Location unknown; used only as ornamental.

Fraxinus profunda (Bush) Bush **pumpkin ash**

France: Barres, Champeaux.

Fraxinus quadrangulata Michx. **blue ash**
British Isles: In botanic gardens.
France: Champeaux, Maulévrie.
Germany: Hamburg Botanic Garden.

Fraxinus texensis (A. Gray) Sarg. **Texas ash**
British Isles: Kew.

Fraxinus velutina Torr. **velvet ash**
British Isles: Kew.
France: Barres.

Fremontia californica Torr. **California fremontia**
British Isles: Nymans.

Garrya elliptica Dougl. **wavyleaf silktassel**
British Isles: Nymans.
France: Barres, Rennes Botanic Garden.
Germany: Heidelberg.

Garrya fremontii Torr. **Fremont silktassel**
Germany: Heidelberg.

Garrya wrightii Torr. **Wright silktassel**
Germany: Darmstadt Botanic Garden.

Gaultheria procumbens L. **checkerberry wintergreen**
Belgium: Beernem.
British Isles: Nymans.
France: Barres, Vilmorin.

Gaultheria shallon Pursh **salal**
British Isles: Dropmore, New Forest, Nymans.
France: Barres.
Germany: Weinheim.

Gaylussacia frondosa (L.) Torr. & Gray **dangleberry**
British Isles: Nymans.

Gelsemium sempervirens (L.) Ait. **Carolina-jessamine**
British Isles: Nymans.

Gleditsia aquatica Marsh. **waterlocust**
British Isles: Kew.
Germany: Cologne City Garden.

Gleditsia ×texana Sarg. **Texas honeylocust**
British Isles: Nymans.

Gleditsia triacanthos L. **honeylocust**
Argentina: Buenos Aires.
Belgium: Court-Saint-Etienne, Louvain, Tervueren, Zangerey.
British Isles: Fairly common in gardens, particularly in England. London, Nymans.
Cyprus: Grown in protected places up to 1,000 feet elevation; locations unknown.
Denmark: Aalholm, Copenhagen, Charlottenlund, Fuglsang.

France: Barres, Colmar, Fremont, Montpellier (Ecole d'Agriculture), Mt. Aigoual, Nantes Botanic Garden, Nimes, Prafrance, Rennes Botanic Garden, Schlumberger, Villa Hanbury (Nice), Vilmorin.
Germany: Aachen, Altona, Augsburg, Bamberg, Braunfels, Cannstatt, Cologne City Forest, Cronberg, Erlangen, Frankfurt a. Oder, Fürstlich Drehna, Hiedelberg, Hohen-Niendorf, Kalkhorst, Ludwigslust, Magdeburg, Mettlach, Muskau, Nürnberg, Potsdam, Riddagshausen, Scharfenberg, Seebach, Teltow, Trier, Tübingen, Weinheim, Wendisch-Wilmersdorf Wiesbaden, Wilhelma, Wissen.
Netherlands: Landfort.
Palestine: Acre, Jerusalem.
Poland: Beuthen, Glogau, Königsberg, Oliva.
Portugal: Coimbre.
Russia: Bryansk region, Ukraine.
South Africa: Locations unknown; grown for many years; hardy.
Switzerland: Zurich.

Gleditsia triacanthos var. **elegantissima** (Grosdemange) Rehd. **bushy honeylocust**

France: Barres.

Gordonia lasianthus (L.) Ellis **loblolly-bay**

British Isles: Nymans.

Gymnocladus dioicus (L.) K. Koch **Kentucky coffeetree**

Belgium: Héverlé, Tervueren, Waremme.
British Isles: Not common. Colesborne, Kew, Nymans, Tubney.
Denmark: Aalholm, Fuglsang, Gisselfeld, Hardenberg, Holstenhuus.
France: Barres, Bois de Boulogne, Cherbourg, Colmar City Park, Fosse, Geneste City Park, Harcourt, Montpellier (Ecole d'Agriculture), Morlaix, Nice, St. Mandé (used as a street tree), Schlumberger, Strasbourg, Vilmorin.
Germany: Aachen, Augsburg, Braunfels, Dyck, Destedt Park, Eisenach, Erlangen, Frankfurt a. Main, Frankfurt a. Oder, Harbke Park, Hohenheim, Karlsruhe, Lindau, Magdeburg, Mainau Island, Mettlach, Nürnberg, Pillnitz, Potsdam, Putbus, Ralswiek, Schwerin, Sophienhof, Tübingen, Weimar, Weinheim, Wilhelma, Wissen.
Latvia: Riga.
Poland: Glogau, Königsberg.
Portugal: Coimbre.
Romania: Hatarmajor.
Russia: Ukraine.
Spain: Madrid.
Sweden: Alnarp.
Switzerland: Marienberg.

Halesia carolina L. **Carolina silverbell**

Belgium: Beernem, Vogelsanck Park.
British Isles: Nymans.
France: Barbier nurseries, Barres, Brest Marine Gardens, Catros, Geneste City Park, Harcourt.
Germany: Augsburg, Cleve, Dörenthe, Dyck, Frankfurt a. Oder, Ludwigslust, Magdeburg, Münster, Muskau, Wörlitz.
Netherlands: Wageningen.
Poland: Danzig, Freienhuben, Oliva, Sagan.

Romania: Hatarmajor.
Sweden: Alnarp.

Halesia carolina var. **monticola** Rehd. — **mountain silverbell**

France: Barres.
Germany: Weinheim.

Halesia diptera Ellis — **two-wing silverbell**

British Isles: Kew, Nymans.
France: Barbier nurseries.
Germany: Hamburg Botanic Garden.

Hamamelis vernalis Sarg. — **vernal witch-hazel**

France: Barres.

Hamamelis virginiana L. — **witch-hazel**

Austria: Vienna.
Denmark: Aalholm.
France: Barres, Catros, Champeaux, Maulévrie, Vilmorin.
Germany: Cologne Botanic Garden, Destedt Park, Hamburg Botanic Garden, Magdeburg.
Latvia: Riga.
Poland: Beuthen, Königsberg, Oliva.
Romania: Hatarmajor.
Switzerland: Zurich.

Holodiscus discolor (Pursh) Maxim. — **creambush rockspirea**

British Isles: Nymans.
Denmark: Copenhagen.
France: Barres, Caën, Vilmorin.
Germany: Hamburg Botanic Garden.
Poland: Gleiwitz.

Holodiscus dumosus (Nutt.) Heller — **bush rockspirea**

France: Barres.

Hydrangea arborescens L. — **smooth hydrangea**

British Isles: Nymans.
France: Barres.

Hydrangea arborescens forma **grandiflora** Rehd. — **snowhill hydrangea**

France: Barres.

Hydrangea cinerea Small — **ashy hydrangea**

France: Barres.

Hydrangea cinerea forma **sterilis** Rehd. — **sterile ashy hydrangea**

France: Barres.

Hydrangea quercifolia Bartr. — **oakleaf hydrangea**

France: Barres.

Hydrangea radiata Walt. — **silverleaf hydrangea**

France: Barres.

Hypericum frondosum Michx. — **golden St. Johnswort**

France: Vilmorin.

Hypericum galioides Lam. — **bedstraw St. Johnswort**
France: Barres, Vilmorin.

Hypericum prolificum L. — **shrubby St. Johnswort**
France: Barres.

Ilex cassina L. — **dahoon**
Germany: Heidelberg.

Ilex decidua Walt. — **possumhaw**
British Isles: Nymans.
France: Barbier nurseries, Barres.

Ilex laevigata (Pursh) A. Gray — **smooth winterberry**
France: Barres.

Ilex montana Torr. & Gray — **mountain winterberry**
France: Barbier nurseries.

Ilex opaca Ait. — **American holly**
British Isles: Often grown; locations unknown.
Denmark: Charlottenlund, Copenhagen.
France: St. Mandé (Ecole d'Arboriculture).
Germany: Heidelberg.

Ilex verticillata (L.) A. Gray — **common winterberry**
British Isles: Nymans.
Denmark: Charlottenlund, Copenhagen.
France: Vilmorin.
Germany: Augsburg, Giessen, Scharfenberg.
Poland: Danzig, Freienhuben, Königsberg.

Illicium floridanum Ellis — **Florida anise-tree**
British Isles: Nymans.
Italy: Isola Bella (region of Lac Majeur).

Itea virginica L. — **Virginia sweetspire**
British Isles: Nymans.
France: Barres, Brest Marine Gardens, Catros, Limoges, Pézanin, Vilmorin
Germany: Cronberg, Hamburg Botanic Garden, Scharfenberg.
Poland: Glogau, Königsberg.

Jamesia americana Torr. & Gray — **cliff jamesia**
Austria: Vienna.
British Isles: Nymans.
Denmark: Copenhagen.
France: Barres, Pézanin, St. Mandé (Ecole d'Arboriculture), Vilmorin.
Germany: Darmstadt Botanic Garden, Hamburg Botanic Garden, Lindau.
Netherlands: Wageningen.
Poland: Königsberg.

Jamesia americana var. rosea Purpus — **rose cliff jamesia**
British Isles: Nymans.

Juglans californica S. Wats. — **California walnut**
France: Champeaux, Maulévrie.

Juglans cinerea L. **butternut**

Austria: 1 area (600 trees, location unknown); planted in state and communal forests.

Belgium: Cedrogne, Lanklaer, Nassogne, St. Michel, Sept-Fontaines, Tervueren.

British Isles: Colesborne, Kilmacurragh, Stratfield Saye, Tubney.

Denmark: Copenhagen Botanic Garden, Häsede.

Finland: Mustila, Tammisto.

France: Barres, Maulévrie, Mt. Aigoual, Pézanin, Trianon (Ecole d'Horticulture), Vilmorin.

Germany: Aachen, Augsburg, Barnstorf, Braunfels, Cologne City Forest, Darmstadt Botanic Garden, Eisenach, Giessen, Heidelberg City Forest, Hohenheim, Ludwigslust, Mainau Island, Mettlach, Münster, Nürnberg, Schleswig-Holstein, Schwerin, Seebach, Sophienhof, Teltow.

Latvia: Riga.

Poland: Glogau, Königsberg, Oliva.

Russia: Baltic Provinces, Bryansk region.

Ryukyu Islands.

Switzerland: Zurich.

Juglans hindsii Jeps. **Hinds walnut**

France: Barres.

Juglans major (Torr.) Heller **Arizona walnut**

France: Barres.

Juglans microcarpa Berlandier **little walnut**

Austria: Vienna.

British Isles: Colesborne, Kew, Tortworth.

France: Barres, Maulévrie, Metz, Mt. Aigoual.

Poland: Glogau.

Juglans nigra L. **black walnut**

Argentina.

Austria: 19 areas (16,400 trees, locations unknown) planted in state and communal forests.

Belgium: Planted extensively along main roads. Cedrogne, Hertogenwald, Héverlé, Laeken (Royal Park), Lanklaer, Nassogne, St. Michel, Sept-Fontaines, Tervueren, Vogelsanck Park.

British Isles: Requires exceptionally favorable soil and climatic conditions. Ballykilcavan, Bedgebury, Bisham Abbey, Bute House, Cirencester, Colesborne, Highclere, Stratfield Saye, Tubney.

Denmark: Aalholm, Copenhagen Botanic Garden, Gisselfeld, Sölestedgaard

Finland: Tammisto.

France: Barres, Brest Marine Gardens, Champenoux, Fremont, Geneste City Park, Harcourt, Limoges, Maulévrie, Montpellier (Ecole d'Agriculture), Morlaix, Mt. Aigoual, Nimes, Pézanin, Schlumberger, Tarbes, Vilmorin.

Germany: Altendöbern, Augsburg, Baden-Baden, Bavaria (state forests), Biebrich, Buddenhagen, Cannstatt, Cleve, Darmstadt Botanic Garden, Destedt Park, Eberswalde, Erfurt Forest, Erlangen, Frankfurt a. Oder, Gadow, Gracht, Grafrath, Hambach, Harbke Park, Harzburg, Heidelberg, Hohenheim, Hohen-Niendorf, Karlsruhe, Lindau, Magdeburg, Mettlach

Muskau, Nürnberg, Potsdam, Prussia, Putbus, Rosenstein Park, Scharfenberg, Schleswig-Holstein, Schwerin, Sophienhof, Teltow, Tübingen, Weimar, Weinheim, Wissen, Wörlitz.
Italy: Apennine mountains.
Latvia: Riga.
Luxembourg.
Netherlands: Arnhem, Landfort, Vogelzanck.
Poland: Glogau, Gumbinnen, Königsberg.
Portugal: Bussaco, Forest of Coupat, Montserrate.
Romania: Hatarmajor.
Russia: Bryansk region.
South Africa: Small experimental plantations; show good growth; locations unknown.
Spain.
Sweden: Alnarp.
Switzerland: Zurich.
Yugoslavia.

Juniperus ashei Buchholz — **Ashe juniper**

South Africa: Small trials made; locations unknown; hardy but slow-growing.

Juniperus communis L. — **common juniper**

Belgium: Héverlé.
France: Grêve, Maulévrie, Vilmorin.

Juniperus deppeana Steud. — **alligator juniper**

Austria: Vienna.
British Isles: Bedgebury, Kew.
France: Barres, Fosse, Nice, Pézanin.
South Africa: Arboretum plots; locations unknown; hardy but slow-growing.

Juniperus flaccida Schlecht. — **drooping juniper**

France: Angers.
British Isles: Bicton.
Italy: Genoa Botanic Garden, Naples Botanic Garden.

Juniperus occidentalis Hook. — **western juniper**

British Isles: Dawyck.
France: Barres, Maulévrie.
Germany: Mainau Island.
Sweden: Alnarp.

Juniperus osteosperma (Torr.) Little — **Utah juniper**

France: Barres.

Juniperus scopulorum Sarg. — **Rocky Mountain juniper**

British Isles: Dawyck.
France: Barres.
Germany: Cronberg.

Juniperus virginiana L. — **eastern redcedar**

Austria: Altmünster; also 3 areas (1,600 trees) planted in state and communal forests.
Belgium: Hertogenwald, Héverlé, Louvain, Tervueren.
Bermuda.

British Isles: Frequently but not extensively planted; hardy. Cardiff, Nymans, Tubney.
Denmark: Aalholm, Brahetrolleborg, Copenhagen, Fuglsang.
France: Barres, Catros, Champeaux, Colombez, Fosse, Fremont, Geneste City Park, Grêve, Harcourt, Maulévrie, Metz, Montpellier (Ecole d'Agriculture), Mt. Aigoual, Nimes, Prafrance, Seneclauze Estate, Versailles (Petit Trianon), Villa Thuret (Nice), Vilmorin.
Germany: Altona, Augsburg, Baden-Baden, Barnstorf, Bavaria, Braunfels, Cronberg, Dammerutz, Dyck, Eisenach, Falkenstein, Frankfurt a. Oder, Gadow, Haag Park, Hambach, Heidelberg City Forest, Hohen-Niendorf, Kromlau, Lindau, Magdeburg, Mainau Island, Münster, Muskau, Nürnberg, Prussia, Putbus, Riddagshausen, Schleswig-Holstein, Schlosse Friedrichshof, Schlemmin, Schlenderhan, Schwerin, Teltow, Tharandt, Tübingen, Weimar, Weinheim, Wendisch-Wilmersdorf, Wissen, Wörlitz Park.
Hungary.
India.
Italy: Apennine mountains, Isola Madre (region of Lac Majeur).
Japan: Asakawa.
Latvia: Riga.
Luxembourg.
Netherlands: Het Loo, Schovenhorst, Vogelzanck.
Poland: Allenstein, Glogau, Gosda, Königsberg, Prussia, Sagan.
Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Bryansk region, Ukraine.
South Africa: Widely planted in some areas; locations unknown; hardy.
Spain: Madrid.
Switzerland: Constance, Wabern.

Kalmia angustifolia L. **lambkill kalmia**

Austria: Vienna.
British Isles: Nymans.
France: Barres, Vilmorin.
Germany: Dörenthe.

Kalmia latifolia L. **mountain-laurel**

Austria: Vienna.
Belgium: Beernem, Vogelsanck Park.
British Isles: Nymans.
France: Barres, Brest Marine Gardens, Caën, Versailles (Petit Trianon), Vilmorin.
Germany: Cleve, Dörenthe, Grevenbroich, Heidelberg.
Italy.
Poland: Oliva.
Sweden: Alnarp.

Kalmia polifolia Wangenh. **bog kalmia**

British Isles: Nymans.

Larix laricina (Du Roi) K. Koch **tamarack**

Austria: Vienna.
Belgium: Tervueren.
British Isles: Occasionally planted; has slight or no forest value in Britain.

Ardchullary, Bedgebury, Colesborne, Dropmore, Hargham, Nymans, Tubney.
Denmark: Charlottenlund, Copenhagen.
Finland: Pekola, Tammisto.
France: Barres, Metz, Trianon (Ecole d'Horticulture), Vilmorin.
Germany: Augsburg, Grafrath, Heidelberg, Sophienhof, Wendlisch-Wilmersdorf.
Norway.
Poland: Königsberg.
Russia: Bryansk region, Moscow.

Larix lyallii Parl. **subalpine larch**
Belgium: Tervueren.
British Isles: Needs a colder climate than that of Britain. Dawyck, Nymans.

Larix occidentalis Nutt. **western larch**
Austria: Vienna.
Belgium: Cedrogne, Gedinne, St. Michel, Tervueren.
British Isles: Inferior to common larch; no silvicultural value. Ardchullary, Bayfordbury, Bedgebury, Brocklesby Park, Glendye Woods, Gordon Castle, Kew, Novar Estate, Tubney.
Denmark: Egelund.
Finland: Helsingfors, Pekola, Tammisto.
France: Barbier nurseries, Barres, Champeaux, Pézanin, Vilmorin.
Germany: Altona, Weinheim.
Russia: Bryansk region, Moscow.
Sweden.

Ledum groenlandicum Oeder **Labradortea**
Austria: Vienna.
British Isles: Nymans.
France: Vilmorin.
Germany: Heidelberg.

Leiophyllum buxifolium (Bergius) Ell. **box sandmyrtle**
British Isles: Nymans.
France: Vilmorin.

Leucothoë axillaris (Lam.) D. Don **coast leucothoë**
British Isles: Nymans.
France: Barres, Geneste City Park, Pézanin.

Leucothoë editorum Fern. & Schub. **drooping leucothoë**
British Isles: Nymans.
France: Barres, Vilmorin.

Leucothoë populifolia (Lam.) Dipp. **Florida leucothoë**
France: Geneste City Park.

Leucothoë racemosa (L.) A. Gray **sweetbells leucothoë**
British Isles: Nymans.
France: Barres.

Libocedrus decurrens Torr. **incense-cedar**
Australia: Australian Capital Territory.
Austria: Altmünster.

Belgium: Calmpthout, Gedinne, St. Michel, Tervueren, Three Kings Park, Waremme.

British Isles: Bagley Wood, Bedgebury, Bicton, Brahan, Colesborne, Dropmore, Eastnor Castle, Frogmore, Fulmodestone Wood, Heckfield Place, Hope Toun, Monk Hopton, Murthly, Silia, Tubney.

Denmark: Aalholm, Häsede, Knuthenborg, Langesoe, Ravnholt.

France: Barres, Brest Marine Gardens, Champeaux, Champenoux, Fosse, Fremont, Geneste City Park, Harcourt, Maulévrie, Montpellier, Mt. Aigoual, Nantes, Nice, Prafrance, Rennes, Sénéclauze Estate, Vilmorin.

Germany: Aachen, Altona, Augsburg, Baden-Baden, Badenweiler, Cannstatt, Cleve, Cologne Botanic Garden, Cronberg, Darmstadt Botanic Garden, Eisenach, Erlangen, Gadow, Hiedelberg City Forest, Hohenheim, Hohen-Neindorf, Kalkhorst, Karlsruhe, Lehrte, Lindau, Lousberg Villa, Mainau Island, Münster, Pillnitz, Potsdam, Prussia, Ralswiek, Riddagshausen, Schwerin, Tharandt, Weinheim, Wendisch-Wilmersdorf, Wiesbaden, Wörlitz.

Italy: Isola Madre, Rovelli nurseries (both in Lac Majeur region).

Japan: Asakawa.

Netherlands: Arnhem, Schovenhorst.

New Zealand: Wellington (fine old trees).

Poland: Oliva.

Portugal: Bussaco.

Russia: Ukraine.

Sweden: Alnarp.

Switzerland: Constance, Zurich.

Lindera benzoin (L.) Blume — **common spicebush**

France: Maulévrie, Strasbourg, Vilmorin.

Germany: Augsburg, Münster, Potsdam, Scharfenberg.

Poland: Danzig, Freienhuben.

Liquidambar styraciflua L. — **sweetgum**

Austria: Vienna.

Belgium: Court-Saint-Etienne, Laeken (Royal Park), St. Michel, Sept-Fontaines, Tervueren, Vogelsanck Park, Waremme, Zangerey.

British Isles: Favorite ornamental, useless in forestry; scarce in England. Bedgebury, Fota, Nymans, Syon.

Denmark: Hardenberg.

France: Baleine, Barbier nurseries, Barres, Bois de Boulogne, Caën, Catros, Côtes, Geneste City Park, Harcourt, Limoges, Montpellier (Ecole d'Agriculture), Mt. Aigoual, Nimes, Nouan, Prafrance, Rennes, Trianon (Ecole d'Horticulture), Vilmorin.

Germany: Aachen, Cologne City Forest, Darmstadt Botanic Garden, Frankfurt a. Main, Karlsruhe, Ludwigslust, Münster, Nürnberg, Potsdam, Riddagshausen, Weinheim, Wendisch-Wilmersdorf, Wörlitz.

Italy: Isola Madre (region of Lac Majeur), Naples, Palermo.

Japan: Asakawa.

Netherlands: Arnhem, Vogelzanck.

Poland: Danzig, Freienhuben, Glogau, Königsberg.

Romania: Hatarmajor.

Russia: Ukraine.

South Africa: Locations unknown; few ornamentals and arboretum plots.

Spain.

Switzerland: Marienberg, Zurich.

Liriodendron tulipifera L. — **yellow-poplar (tuliptree)**

Austria: Linz.
Belgium: Beernem (roadside tree), Bloemendael, Laeken (Royal Park), Lovenjoul, Luxembourg Park, St. Michel, Sept-Fontaines, Vogelsanck Park, Waremme, Zangerey.
British Isles: Ornamental; attains large size; not grown as forest tree. Bedgebury, Cluny, Killerton, London, Longleat, Margam, Nymans, Powderham, Syon, Tubney, Westonbirt.
Denmark: Aalholm, Brahetrolleborg, Häsede, Holstenhuus, Langesoe.
France: Barres, Bois de Boulogne, Bordeaux, Brest Marine Gardens, Caën, Colmar City Park, Fremont, Geneste, Harcourt, Limoges, Metz, Montpellier, Morlaix, Nantes, Nimes, Porzantrez, Quimper, Rennes, Versailles (Petit Trianon), Villa Thuret, Vilmorin.
Germany: Altona, Augsburg, Baden-Baden, Bamberg, Braunfels, Buddenhagen, Cleve, Cologne City Garden, Cronberg, Eisenach, Frankfurt a. Oder, Freiburg Botanic Garden, Fürstlich Drehna, Gadow, Grafrath, Harbke Park, Harzburg, Heidelberg City Forest, Hohenheim, Kaartz, Kalkhorst, Karlsruhe, Kromlau, Lehrte, Lindau, Lousberg Villa, Magdeburg, Mettlach, Münster, Muskau, Nürnberg, Pförten, Potsdam, Putbus, Ralswiek, Riddagshausen, Schwerin, Seebach, Sophienhof, Trier, Weinheim, Wendisch-Wilmersdorf, Wiesbaden, Wörlitz.
Italy: Villa Troubetzkoy (region of Lac Majeur).
Japan: Asakawa.
Latvia: Riga.
Netherlands: Arnhem, Het Loo, Landfort, Vogelzanck.
Poland: Beuthen, Danzig, Freienhuben, Gleiwitz, Glogau, Königsberg, Oliva.
Portugal: Bussaco, Porto.
Romania: Hatarmajor.
Russia: Ukraine.
South Africa: Location unknown; some specimen trees have grown well.
Sweden: Alnarp.
Switzerland: Constance, Marienberg, Zurich.

Lithocarpus densiflorus (Hook. & Arn.) Rehd. — **tanoak**

British Isles: Unknown except at Kew.

Lonicera dioica L. — **limber honeysuckle**

France: Barres.

Lonicera flava Sims. — **yellow honeysuckle**

France: Vilmorin.

Lonicera involucrata (Richards.) Banks — **bearberry honeysuckle**

France: Pézanin.
Germany: Hamburg Botanic Garden.

Lonicera prolifera (Kirchn.) Rehd. — **grape honeysuckle**

France: Pézanin.

Lonicera sempervirens L. — **trumpet honeysuckle**

British Isles: Nymans.
Germany: Heidelberg.
Romania: Hatarmajor.

Lonicera utahensis S. Wats. **Utah honeysuckle**

Germany: Wendisch-Wilmersdorf.

Lupinus arboreus Sims **tree lupine**

France: Vilmorin.

Lycium pallidum Miers **pale wolfberry**

British Isles: Nymans.
Germany: Darmstadt Botanic Garden.

Lyonia ligustrina (L.) DC. **he-huckleberry (maleberry)**

France: Barres.
Netherlands: Wageningen.

Lyonia mariana (L.) D. Don **staggerbush lyonia (staggerbush)**

British Isles: Nymans.
France: Barres.

Maclura pomifera (Raf.) Schneid. **Osage-orange**

British Isles: Nymans, Tubney.
France: Barres, Cherbourg (several parks), Maulévrie, Montpellier (Ecole d'Agriculture), Mt. Aigoual, Nantes, Nimes, Pézanin, Prafrance, Rennes, Vilmorin.
Germany: Karlsruhe, Mainau Island, Ralswiek, Tübingen.
Italy.
Netherlands: Wageningen.
Portugal: Forest of Choupat.
Romania: Hatarmajor.
Russia: Ukraine.
Switzerland: Zurich.

Magnolia acuminata L. **cucumbertree**

Belgium: Beernem, Héverlé, Sept-Fontaines.
British Isles: Southern England and Ireland. Colesborne, Margam, Nymans, Tubney.
Denmark: Aalholm, Charlottenlund, Copenhagen, Gisselfeld, Häsede, Knuthenborg.
Finland: Mustila.
France: Barres, Bois de Boulogne, Catros, Champeaux, Fosse, Geneste City Park, Harcourt, Metz, Morlaix, Nantes, Prafrance, Sénéclauze Estate, Vilmorin.
Germany: Altendöbern, Altona, Augsburg, Baden-Baden, Braunfels, Cologne City Garden, Dammerutz, Destedt Park, Eisenach, Frankfurt a. Oder, Giessen, Grambow, Harbke Park, Hohen-Niendorf, Karlsruhe, Lehrte, Lindau, Magdeburg, Mettlach, Muskau, Nürnberg, Pförten, Potsdam, Putbus, Rosenstein Park, Schloss Dyck, Schwerin, Sophienhof, Wilhelma, Wörlitz.
Netherlands: Het Loo.
Poland: Glogau, Gosda, Königsberg, Oliva.
Portugal: Bussaco.
Romania: Hatarmajor.
Sweden: Alnarp, Lund.
Switzerland: Marienberg, Zurich.

Magnolia acuminata var. **cordata** (Michx.) Sarg. **yellow cucumbertree**

France: Fosse, Harcourt, Strasbourg.
Germany: Ausgburg.
Netherlands: Wageningen.
Portugal: Montserrate.

Magnolia fraseri Walt. **Fraser magnolia**

British Isles: Very uncommon in England. Cardiff, Nymans.
France: Barres, Fosse.
Germany: Karlsruhe.

Magnolia grandiflora L. **southern magnolia**

Argentina.
British Isles: Briton Ferry, Powderham.
Denmark: Knuthenborg.
France: Barres, Bois de Boulogne, Bordeaux, Brest Marine Gardens, Catros, Cherbourg (several parks), Fosse, Geneste City Park, Limoges, Maulévrie, Montpellier, Nantes Botanic Garden, Nice, Nimes, Prafrance.
Germany: Cronberg, Heidelberg, Mainau Island.
Italy: Region of Lac Majeur.
Portugal: Porto.
Spain.

Magnolia macrophylla Michx. **bigleaf magnolia**

British Isles: Nymans.
France: Barres, Fosse, Fremont, Harcourt, Prafrance, Trianon (Ecole d'Horticulture), Versailles (Petit Trianon).
Germany: Baden-Baden, Hamburg Botanic Garden.
Portugal: Bussaco, Montserrate, Porto.
Switzerland: Zurich.

Magnolia tripetala L. **umbrella magnolia**

Belgium: Beernem.
British Isles: Claremont, Nymans.
France: Barres, Geneste City Park, Harcourt, Prafrance, Trianon (Ecole d'Horticulture).
Germany: Baden-Baden, Braunfels, Destedt Park, Dörenthe, Giessen, Karlsruhe, Lindau, Ludwigslust, Trier.
Netherlands: Landfort, Wageningen.
Poland: Glogau, Gosda, Oliva.
Portugal: Bussaco.
Romania: Hatarmajor.

Magnolia virginiana L. **sweetbay**

British Isles: Rare, except in botanic gardens. Nymans.
France: Catros, Fosse, Geneste City Park, Trianon (Ecole d'Horticulture), Vilmorin.
Germany: Augsburg, Cleve, Nürnberg, Wörlitz.
Italy: Villa Barbo (region of Lac Majeur).
Netherlands: Wageningen.
Poland: Danzig, Freienhuben.

Mahonia aquifolium (Pursh) Nutt. **Oregon-grape**

France: Barres, Vilmorin.
Germany: Weinheim.

Italy.
Norway.
Russia: Bryansk region.

Mahonia aquifolium var. **juglandifolia** Jouin — **purple Oregon-grape**
France: Barres.

Mahonia fremontii (Torr.) Fedde — **Fremont mahonia**
Germany: Darmstadt Botanic Garden.
Switzerland: Zurich.

Mahonia nervosa (Pursh) Nutt. — **Cascades mahonia**
British Isles: Nymans.
France: Barres.

Mahonia pinnata (Lag.) Fedde — **cluster mahonia**
Germany: Heidelberg.

Mahonia repens (Lindl.) G. Don — **creeping mahonia**
France: Barres.
Germany: Weinheim.

Mahonia ×wagneri (Jouin) Rehd. — **Wagner mahonia**
France: Barres.

Malus coronaria (L.) Mill. — **sweet crab apple**
France: Barres.

Malus diversifolia (Bong.) Roem. — **Oregon crab apple**
France: Barres.

Menispermum canadense L. — **common moonseed**
France: Barres, Vilmorin.
Germany: Münster.
Netherlands: Wageningen.

Menziesia pilosa (Michx.) Juss. — **Allegany menziesia ("skunkbush")**
British Isles: Nymans.

Morus rubra L. — **red mulberry**
France: Versailles (Petit Trianon)
Germany: Augsburg.
Poland: Königsberg.
Russia: Ukraine.

Myrica californica Cham. — **Pacific bayberry**
France: Maulévrie.

Myrica cerifera L. — **southern bayberry**
Austria: Vienna.
British Isles: New Forest, Nymans.
France: Mt. Aigoual, Vilmorin.
Germany: Muskau.
Poland: Gleiwitz, Königsberg.
Portugal: Lisbon.
Romania: Hatarmajor.

Myrica gale L. — **sweetgale**
Austria: Vienna.
British Isles: Nymans.
Denmark: Copenhagen.
France: Barres, Mt. Aigoual.
Latvia: Riga.
Poland: Königsberg.

Myrica pensylvanica Loisel. — **northern bayberry**
Austria: Vienna.
France: Barres.

Neviusia alabamensis A. Gray — **snowwreath**
British Isles: Nymans.
Denmark: Charlottenlund, Copenhagen.
France: Barres, Vilmorin.
Germany: Darmstadt Botanic Garden.
Netherlands: Wageningen.

Nyssa aquatica L. — **water tupelo**
British Isles: Scarcely known in England.
France: Fosse, Harcourt, Trianon (Ecole d'Horticulture).
Germany: Destedt Park, Münster.
Ryukyu Islands.

Nyssa sylvatica Marsh. — **black tupelo; blackgum**
Belgium: Brasschaet.
British Isles: Scarce in England. Bicton, Nymans, Stratfield Saye.
France: Barres, Geneste City Park.
Germany: Darmstadt Botanic Garden, Grafrath, Hamburg Botanic Garden, Heidelberg City Forest, Weinheim.
Romania: Hatarmajor.

Nyssa sylvatica var. **biflora** (Walt.) Sarg. — **swamp tupelo; blackgum**
Belgium: Tervueren.
British Isles: Stratfield Saye.

Oplopanax horridus (Smith) Miq. — **American devilsclub**
Finland: Mustila.
Germany: Darmstadt Botanic Garden.

Opuntia imbricata (Haw.) DC. — **walkingstick chlola**
British Isles: Nymans.

Osmaronia cerasiformis (Torr. & Gray) Greene — **osoberry**
British Isles: Nymans.
France: Maulévrie, Vilmorin.
Germany: Hamburg Botanic Garden, Nürnberg.
Netherlands: Wageningen.
Romania: Hatarmajor.
Sweden: Alnarp.

Ostrya virginiana (Mill.) K. Koch — **eastern hophornbeam**
Belgium: Tervueren.
British Isles: Rare, but grows well. Colesborne, Tortworth, Tubney.
France: Barres, Strasbourg.

Germany: Cannstatt, Lousberg Villa, Muskau, Riddagshausen, Scharfenberg.
Romania: Hatarmajor.

Pachistima canbyi A. Gray ———
British Isles: Nymans.
Germany: Darmstadt Botanic Garden.

Parkinsonia aculeata L. **Jerusalem-thorn**
Cyprus: A few healthy plants. Locations unknown.
India: Locations unknown; cultivated, becoming naturalized in dry regions; often used for hedges.
Palestine: Locations unknown; planted experimentally under arid conditions; promising.
South Africa: Locations unknown; grown as ornamental; thriving.

Parthenocissus inserta (Kerner) Fritsch **thicket creeper**
France: Barres.

Parthenocissus quinquefolia (L.) Planch. **Virginia creeper**
British Isles: Nymans.
France: Barres, Vilmorin.
Latvia: Riga.
Netherlands: Wageningen.
Romania: Hatarmajor.
Russia: Bryansk region.

Penstemon fruticosus (Pursh) Greene **beard tongue**
Germany: Darmstadt Botanic Garden.

Penstemon heterophyllus Lindl. ———
British Isles: Nymans.

Peraphyllum ramosissimum Nutt. **squaw apple**
British Isles: Nymans.
Germany: Darmstadt Botanic Garden.

Philadelphus californicus Benth. **California mockorange**
France: Barres.

Philadelphus floridus Beadle **Beadle mockorange**
France: Barres.

Philadelphus gordonianus Lindl. **Gordon mockorange**
France: Barres.

Philadelphus gordonianus var. **columbianus** (Koehne) Rehd. **Columbia River mockorange**
France: Barres.

Philadelphus grandiflorus Willd. **big scentless mockorange**
France: Barres.
Germany: Hamburg Botanic Garden.
Poland: Gleiwitz.

Philadelphus hirsutus Nutt. **hairy mockorange**
British Isles: Nymans.
Russia: Bryansk region.

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Philadelphus inodorus L. — **scentless mockorange**

France: Barres.
Poland: Gleiwitz.
Russia: Bryansk region.

Philadelphus laxus Schrad. — **drooping mockorange**

France: Barres.

Philadelphus lewisii Pursh — **Lewis mockorange**

France: Barres, Vilmorin.

Philadelphus microphyllus A. Gray — **littleleaf mockorange**

France: Barres.
Germany: Hamburg Botanic Garden.

Philadelphus pubescens Loisel. — **hoary mockorange**

France: Barres.
Poland: Gleiwitz.

Philadelphus pubescens var. **intectus** (Beadle) A. H. Moore — ———

France: Barres.

Physocarpus bracteatus (Rydb.) Rehd. — **twinpod ninebark**

France: Barres.

Physocarpus capitatus (Pursh) Kuntze — **Pacific ninebark**

Russia: Bryansk region.

Physocarpus intermedius (Rydb.) Schneid. var. **parvifolius** Rehd. — **dwarf Illinois ninebark**

France: Barres.

Physocarpus malvaceus (Greene) Kuntze — **mallow ninebark**

France: Barres.

Physocarpus monogynus (Torr.) Coult. — **mountain ninebark**

France: Barres.
Poland: Königsberg.

Physocarpus opulifolius (L.) Maxim. — **common ninebark**

British Isles: Cluny, Nymans.
France: Barres.
Poland: Gleiwitz.
Russia: Bryansk region.

Picea breweriana S. Wats. — **Brewer spruce**

Belgium.
British Isles: Bedgebury, Dawyck, Kew, Stanage Park.
France: Barres, Fosse.
Germany: Dörenthe, Tannenhöft, Wendisch-Wilmersdorf.

Picea englemannii Parry — **Engelmann spruce**

Austria: 2 areas (1,300 trees, locations unknown) planted in state and communal forests.
Belgium: Bloemendael, Cedrogne, Gedinne, Sept-Fontaines, Tervueren.
British Isles: Cultivated as ornamental; no importance for forest purposes; inferior to common spruce in growth. Ardchullary, Bedgebury, Benmore, Dawyck, Isle of Man, Murthly, Nymans, Tubney.

Denmark: Copenhagen, Gisselfeld.
Finland: Mustila, Pekola, Tammisto.
France: Barres, Harcourt, Maulévrie, Vilmorin.
Germany: Altendöbern, Altona, Augsburg, Baden-Baden, Barnstorf, Cronberg, Frankfurt a. Oder, Freienwalde a. Oder, Gadow, Heidelberg City Forest, Hohenheim, Hohen-Niendorf, Lousberg Villa, Nürnberg, Pillnitz, Prussia, Putbus, Riddagshausen, Schlemmin, Schleswig-Holstein, Schwerin, Seebach, Sophienhof, Tharandt, Weinheim, Wendisch-Wilmersdorf, Wernigerode, Wilhelma, Wörlitz Park.
Iceland.
Italy: Rovelli nurseries (region of Lac Majeur).
Latvia: Riga.
Netherlands: Schovenhorst.
Norway.
Poland: Allenstein, Danzig, Freienhuben, Gleiwitz, Glogau, Sagan.
Portugal: Bussaco.
Russia: Bryansk region, Moscow.
Sweden: Alnarp, Jönköping.
Switzerland: Planted at high elevations for protection. Pontresina, St. Moritz.

Picea glauca (Moench) Voss **white spruce**

Australia: Canberra, Tasmania.
Austria: 4 areas (2,000 trees, locations unknown) planted in state and communal forests.
Belgium: Cedrogne, Gedinne, Grand Bois, St. Michel, Three Kings Park, Tervueren.
British Isles: Very hardy; in Scotland and northern England is used on cold exposed sites at high elevations. Scattered throughout these countries and Ireland as shelter tree. Bagley Wood, Bayfordbury, Bedgebury, Benmore, Colesborne, Hope Toun, Isle of Man, Lovat, Nymans, Penrhyn, Tubney.
Denmark: Used as a shelter tree. Aalholm, Copenhagen.
Finland: Mustila, Tammisto.
France: Barres (forest stands), Bois de Boulogne, Champeaux, Fremont, Geneste City Park, Harcourt, Limoges, Mt. Aigoual, Nouan, Sénéclauze Estate, Trianon (Ecole d'Horticulture), Vilmorin.
Germany: Augsburg, Baden-Baden, Bavaria (state forests), Berlin, Coesfelder Berg, Eisenach, Frankfurt a. Main, Frankfurt a. Oder, Fürstlich Drehna, Gadow, Grafrath, Heidelberg City Forest, Hessen-Nassau, Hohen-Niendorf, Kromlau, Kattmannskamp (groups, mixtures), Lindau, Lousberg Villa, Mainau Island, Pförten, Pillnitz, Ralswiek, Reinhardtsbrunn, Riddagshausen, Schlemmin, Schleswig-Holstein, Schlosse Friedrichshof, Schwerin, Seebach, Sophienhof, Tannenhöft, Tharandt, Weinheim, Wendisch-Wilmersdorf, Wilhelma, Wörlitz Park.
Iceland.
Latvia: Riga.
Luxembourg.
Netherlands: Schovenhorst.
Norway: Locations unknown; some in the north and others south of the Dovrefjell.
Poland: Danzig, Freienhuben, Gosda, Königsberg, Prussia.

Portugal: Bussaco.
Russia: Bryansk region, Moscow.
Sweden: Alnarp.
Switzerland: Lucerne, St. Moritz, Wabern, Zurich.

Picea glauca var. **albertiana** (S. Brown) Sarg. **western white spruce**

Belgium: Gedinne, Nassogne.
British Isles: Bedgebury, Hope Toun, Murthly, Tubney.
France: Barres, Champeaux.

Picea mariana (Mill.) B. S. P. **black spruce**

Belgium: Gedinne, Grand Bois, Hertogenwald, Laeken, St. Michel, Tervueren.
British Isles: Very hardy but slow growing; not planted on a large scale. Bagley Wood, Beaufort Castle, Benmore, Cardiff, Cluny, Hope Toun, Nymans, Penrhyn, Tubney.
Denmark: Charlottenlund, Copenhagen.
Finland: Tammisto.
France: Barbier nurseries, Barres, Geneste City Park, Harcourt, Maulévrie, Nimes, Rennes Botanic Garden, Trianon (Ecole d'Horticulture), Vilmorin.
Germany: Augsburg, Barnstorf, Bavaria, Buddenhagen, Eisenach, Falkenstein, Gadow, Grevenbroich, Heidelberg City Forest, Hohenheim, Lousberg Villa, Magdeburg, Muskau, Pförten, Pillnitz, Riddagshausen, Schlemmin, Schwerin, Sophienhof, Tannenhöft, Wendisch-Wilmersdorf, Wernigerode, Wörlitz Park.
Latvia: Riga.
Netherlands: Schovenhorst, Wageningen.
Norway.
Poland: Gleiwitz, Glogau, Sagan.
Russia: Moscow.
Spain: Madrid (trees largely same as at Paris).
Sweden: Alnarp.
Switzerland: Lucerne.

Picea pungens Engelm. **blue spruce**

Austria: Three areas (3,300 trees, locations unknown) planted in state and communal forests.
Belgium: Brasschaet, Cedrogne, Gedinne, St. Michel, Sept-Fontaines, Tervueren.
British Isles: Usually unsatisfactory; should be used in mountains. Bedgebury, Colesborne, Hope Toun, Murthly, Nymans, Tring. Tubney.
Denmark: Copenhagen, Gisselfeld, Hindsgavl, Sölestedgaard.
Finland: Mustila, Pekola, Tammisto.
France: Barbier nurseries, Barres, Champeaux, Fremont, Harcourt, Limoges, Maulévrie, Montpellier (Ecole d'Agriculture), Mt. Aigoual, Nouan, Vilmorin.
Germany: 15 acres of test plots (locations unknown); also considerably planted as ornamental; very hardy. Altendöbern, Altona, Augsburg, Baden-Baden, Barnstorf, Bavaria (11,000 trees), Braunfels, Coesfelder Berg (forest plantings), Cologne Botanic Garden, Cronberg, Dahlem, Dammerutz, Eberswalde (group and mixed stands), Falkenstein, Frankfurt a. Oder, Freienwalde a. Oder, Gadow, Haag Park, Heidelberg, Hohengehren Forstamt, Hohenheim, Hohen-Niendorf, Kaartz, Karlsruhe, Kattmannskamp (groups, mixtures), Kromlau, Lindau, Lousberg Villa,

Passau, Pförten, Pillnitz, Prussia, Ralswiek, Riddagshausen, Röttgen, Scharfenberg, Schlemmin, Schleswig-Holstein, Schlosse Friedrichshof, Schwerin, Seebach, Sophienhof, Tannenhöft, Tharandt, Trier, Weimar, Weinheim, Wendisch-Wilmersdorf, Wernigerode, Wilhelma, Wörlitz Park.

Estonia: Tartu.

Hungary: Godollo (best of spruce).

Italy: Isola Madre, Villa Troubetzkoy (both in region of Lac Majeur).

Latvia: Riga.

Luxembourg.

Netherlands: Landfort, Schovenhorst.

Norway.

Poland: Allenstein, Danzig, Freienhuben, Gleiwitz, Glogau, Königsberg, Prussia.

Romania: Hatarmajor.

Russia: Bryansk region, Moscow.

Sweden: Jönköping.

Switzerland: Engadine, Lucerne, Wabern, Zurich.

Yugoslavia.

Picea rubens Sarg. **red spruce**

Austria: Altmünster.

Belgium: Gedinne, Grand Bois, Hertogenwald, St. Michel, Tervueren.

British Isles: Avondale, Bayfordbury, Bedgebury, New Forest, Stanage Park.

Denmark: Fuglsang.

Finland: Mustila, Pekola, Tammisto.

France: Barres (forest stands), Maulévrie, Nouan, Trianon (Ecole d'Horticulture).

Germany: Altona, Augsburg, Schwerin, Tharandt.

Latvia: Riga.

Luxembourg.

Netherlands: Schovenhorst.

Russia: Bryansk region, Moscow.

Picea sitchensis (Bong.) Carr. **Sitka spruce**

Australia: Tasmania, Victoria (Ballarat Water Commission), Westbourne Woods.

Austria: Vienna; also 34 areas (10,800 trees) planted in state and communal forests.

Belgium: Ardennes, Beernem, Belle-Étoile, Cedrogne, Court-Saint-Etienne, Gedinne, Grand Bois, Groenendael, Groenhove, Lovenjoul, Nassogne, Raevels, St. Michel, Tervueren, Vogelsanck Park.

British Isles: Said to be the most important forest tree in Britain. More than 20 million planted annually by the Forestry Commission in western and northern forests. Ardchullary, Bagley Wood, Beaufort Castle, Beauly, Bedgebury, Benmore, Bicton, Cairnhill plantations, Cirencester, Cluny, Colesborne, Curraghmore, Dawyck, Denbighshire, Dunach, Dunster, Durris, Fulmodestone Wood, Glendye Woods, Isle of Man, Lake Vyrnwy, Leighton Hall, Limerick, Moorburnhead plantation, Murthly, New Forest, Nymans, Penrhyn, Philiphaugh, Powerscourt, Scone Estate, Somerset Co. Lands, Stanage Park, Stourhead, Stratfield Saye, Tubney.

Denmark: Aalholm, Charlottenlund, Copenhagen, Häsede, Langdal, Solestedgaard.

Finland: Mustila, Tammisto.

France: Amance (forest stand), Barbier nurseries, Barres, Champeaux, Champenoux, Côtes, Fremont, Harcourt, Jonchere, Limoges, Maulévrie, Mt. Aigoual, Nouan, Sénéclauze Estate, Trianon (Ecole d'Horticulture), Vilmorin.

Germany: Augsburg, Baden-Baden, Badenweiler, Barnstorf, Bavaria (state forests), Buddenhagen, Coesfelder Berg (forest plantings), Cologne, Cronberg, Eberswalde, Eisenach, Erfurt Forest, Freienwalde a. Oder, Gadow, Grafrath, Haag Park, Hambach, Harzburg, Heidelberg City Forest, Hessen-Nassau, Hohengehren Forstamt, Hohen-Niendorf, Kattmannskamp, Lousberg Villa, Mettlach, Muskau, Prussia, Ralswiek, Riddagshausen, Schleswig-Hosltein, Schlosse Friedrichshof, Schwarzwald, Seebach, Sophienhof, Tannenhöft, Teltow, Tharandt, Trier, Weinheim, Wendisch-Wilmersdorf, Wörlitz Park.

Iceland.

India: Kulu.

Luxembourg.

Netherlands: Schovenhorst.

New Zealand: Hanmer Springs.

Norway: Söfteland, south of Bergen.

Poland: Danzig, Freienhuben, Königsberg.

Portugal: Bussaco.

Romania: Hatarmajor.

Sweden: Alnarp.

Yugoslavia.

Pieris floribunda (Pursh) Benth. & Hook. **mountain pieris**

British Isles: Nymans.

France: Barres.

Germany: Altona.

Pinus albicaulis Engelm. **whitebark pine**

Belgium: Tervueren.

British Isles: Kew, Nymans.

Germany: Augsburg, Darmstadt Botanic Garden.

Pinus aristata Engelm. **bristlecone pine**

Belgium: Tervueren.

British Isles: Nymans, Tubney.

Czechoslovakia: Bohemia.

France: Barres, Maulévrie, Strasbourg.

Germany: Augsburg, Cronberg, Darmstadt Botanic Garden, Grafrath, Tannenhöft, Wörlitz Park.

Iceland.

Pinus attenuata Lemm. **knobcone pine**

British Isles: Hardy; grows fairly well on light loam; no silvicultural importance. Bagley Wood, Bedgebury, Bury Hill, Kew.

France: Barres, Maulévrie, Pézanin, Trianon (Ecole d'Horticulture), Vilmorin.

Germany: Wörlitz Park.

New Zealand.

Portugal: Bussaco.

South Africa: Under trial in arboreta (locations unknown); not promising.

Pinus balfouriana Grev. & Balf. **foxtail pine**

British Isles: Edinburgh, Glasnevin, Kent, Tubney.
France: Catros, Maulévrie, Pézanin, Vilmorin.
Germany: Grevenbroich.

Pinus banksiana Lamb. **jack pine**

Australia: New South Wales (forests), Westbourne Woods.
Austria: Two areas (1,600 trees, locations unknown); planted in state and communal forests.
British Isles: Hardy, slow-growing, not important forest tree; should be used only in elevated or exposed places. Balmoral, Beaufort Castle, Bedgebury, Hursley Park, Maiden Bradley Woods, Nymans, Tubney.
Belgium: Cedrogne, Court-Saint-Etienne, Gedinne, Raevels, St. Michel, Three Kings Park, Tervueren, Wenduyne.
Denmark: Charlottenlund, Copenhagen, Sölestedgaard.
Finland: Mustila, Pekola.
France: Barres, Harcourt, Maulévrie, Mt. Aigoual, Vilmorin.
Germany: Altona, Augsburg, Baden-Baden, Bavaria (state forests—574,000 trees), Cologne Botanic Garden, Dörenthe, Eberswalde, Freienwalde a. Oder, Gadow, Grafrath, Hambach, Hessen-Nassau, Hohen-Niendorf, Kattmannskamp, Passau, Potsdam, Prussia, Scharfenberg, Schlemmin, Schwarzwald, Sophienhof, Teltow, Tharandt, Weinheim, Wörlitz Park.
Hungary: Godollo.
Japan: Asakawa.
Korea: Plantation made about 1930, 4½ miles northwest of Suwan.
Latvia: Riga.
Netherlands: Schovenhorst.
New Zealand: Hanmer Springs, South Island (elevation 1,300–2,000 feet).
Norway.
Poland: Beuthen, Danzig, Glogau, Gosda, Oliva, Prussia.
Romania: Hatarmajor.
Russia: Baltic Provinces, Bryansk region, Moscow, Ukraine.
South Africa: Under trial, locations unknown.
Yugoslavia.

Pinus cembroides Zucc. **Mexican pinyon**

British Isles: Few specimens in England. Kew, Nymans.
France: Fosse, Maulévrie, Montpellier (Ecole d'Agriculture).
Italy: Rovelli nurseries (region of Lac Majeur).
South Africa: Locations unknown; under trial in arboreta; growth satisfactory.

Pinus contorta Dougl. **lodgepole pine**

Australia: New South Wales, Tasmania, Westbourne Woods.
Belgium: Gedinne, Grand Bois, Groenendael, Nassogne, Raevels, Tervueren, Three Kings Park, Wenduyne.
British Isles: Being used for forest planting where the site is too bleak and poor for other species. Also in Ireland, Bagley Wood, Balmoral, Bayfordbury, Beaufort Castle, Bedgebury, Bicton, Cluny, Dunach, Isle of Man, Monk Hopton, Moorburnhead plantation, Westonbirt.
Czechoslovakia: Bohemia.
Denmark: Charlottenlund, Copenhagen, Häsede, Hindsgavl, Hurup, Sölestedgaard.

Estonia: Tartu.
Finland: Mustila, Pekola, Tammisto.
France: Barbier nurseries, Barres, Champeaux, Fosse, Harcourt, Maulévrie, Nouan, Vilmorin.
Germany: Augsburg, Baden-Baden, Bavaria (state forests, 64,000 trees), Coesfelder Berg (forest plantings), Falkenstein, Gadow, Grafrath, Heidelberg, Hohen-Niendorf, Schleswig-Holstein, Teltow, Tharandt, Wendisch-Wilmersdorf, Wörlitz Park.
Hungary: Godollo.
Iceland.
Netherlands: Schovenhorst.
New Zealand: Erua State Forest, Hanmer Springs.
Norway: In north and also south of the Dovrefjell.
Poland: Glogau, Königsberg, Sagan.
Russia: Bryansk region, Moscow.
South Africa: Location unknown; tried mainly in arboreta; proved hardy but slow growing and branchy.
Sweden: Alnarp.

Pinus coulteri D. Don — **Coulter pine**

Algeria: Djebel Ouach.
Australia: Australian Capital Territory, Hobart, Victoria (Ballarat Water Commission), Westbourne Woods.
Austria: Vienna.
Belgium: Tervueren.
British Isles: Grown only as ornamental. Fulmodestone Wood, Kew, Nymans, Stratfield Saye, Tubney.
France: Barres, Côtes, Fosse, Limoges, Maulévrie, Montpellier (Ecole d'Agriculture), Nimes, Pézanin, Prafrance, Sénéclauze Estate, Strasbourg.
Germany: Cronberg, Dörenthe, Heidelberg.
Italy: Villa Barbo (region of Lac Majeur).
New Zealand: South Island. Grew very well.
South Africa: Location unknown; arboreta plots generally satisfactory after 10 years' trial.

Pinus echinata Mill. — **shortleaf pine**

Australia: New South Wales, Queensland, Victoria, Western Australia.
British Isles: Very rare. Dropmore, Nymans.
France: Barres, Maulévrie, Nouan, Pézanin, Sénéclauze Estate, Vilmorin.
India.
New Zealand: Waipona.
North Rhodesia.
Ryukyu Islands.
South Africa: Knysna.

Pinus edulis Engelm. — **pinyon**

British Isles: Very rare. Kew, Nymans.
France: Barbier nurseries, Barres, Champeaux, Harcourt, Pézanin, Strasbourg, Vilmorin.
Germany: Darmstadt Botanic Garden, Dörenthe, Grafrath.

Pinus elliottii Engelm. — **slash pine**

Argentina: Province of Buenos Aires.
Australia: New South Wales, Queensland, Western Australia.

British Isles: Bedgebury.
Mauritius.
New Zealand: Waipona.
North Rhodesia.
Nyasaland.
Ryukyu Islands.
South Africa: Knysna; shows promise in variety of locations.

Pinus flexilis James — **limber pine**

Australia: Westbourne Woods.
Belgium: Groenendael, Tervueren.
British Isles: Rare. Kew, Murthly, Nymans, Tubney.
Finland: Tammisto.
France: Barres, Champeaux, Fosse.
Germany: Darmstadt Botanic Garden, Dörenthe, Erlangen, Haag Park, Wendisch-Wilmersdorf.
Hungary:Godollo.
Lithuania.
Netherlands: Schovenhorst.
Norway.
Switzerland: Lucerne.
Yugoslavia.

Pinus glabra Walt. — **spruce pine**

Portugal: Bussaco.

Pinus jeffreyi Grev. & Balf. — **Jeffrey pine**

Australia: Australian Capital Territory, Hobart (Tasmania), New South Wales, Victoria (Ballarat Water Commission), Westbourne Woods.
Austria: Vienna.
Belgium: Ardennes, St. Michel, Three Kings Park, Tervueren.
British Isles: Bagley Wood, Balmoral, Cluny, Colesborne, Dawyck, Dropmore, Fulmodestone Wood, Hope Toun, Nymans, Powis Castle, Stratfield Saye, Tubney.
Denmark: Aalholm, Fuglsang, Hindsgavl, Knuthenborg.
France: Barres, Champeaux, Côtes, Maulévrie, Montpellier (Ecole d'Agriculture), Mt. Aigoual, Sénéclauze Estate, Verrieres.
Germany: Altona, Augsburg, Coesfelder Berg, Cronberg, Darmstadt Bot. Garden, Falkenstein, Freienwalde a. Oder, Gadow, Heidelberg, Hohenheim, Lindau, Mainau Island, Pförten, Prussia, Scharfenberg, Sophienhof, Tharandt, Villa Selve, Weinheim, Wernigerode.
Netherlands: Schovenhorst.
Norway: Christiana.
Poland: Danzig, Glogau, Gosda, Königsberg, Oliva.
Romania: Hatarmajor.
Russia: Leningrad [St. Petersburg].
South Africa.
Sweden: Stockholm.
Switzerland: Lucerne, Wabern.

Pinus lambertiana Dougl. — **sugar pine**

Australia: New South Wales (shows healthy growth in south at 3,500 feet).
Belgium: St. Michel, Three Kings Park, Tervueren.

British Isles: Uncommon. Fruits only in southern England. Bayfordbury, Dropmore, Eastnor Castle, Fulmodestone Wood, Hope Toun, Murthly, Nymans, Tubney, Westonbirt.
France: Barres, Catros, Fosse, Harcourt, Maulévrie, Sénéclauze Estate.
Germany: Grafrath, Kalkhorst, Weinheim.
Italy: Rovelli nurseries (region of Lac Majeur).
Netherlands: Wageningen.
New Zealand: Rotorua.
Poland: Gosda.
Portugal: Bussaco.
South Africa: Location unknown; arboretum plot 10 years old shows promise, but trees suffer from drought.

Pinus monophylla Torr. & Frém. **singleleaf pinyon**

British Isles: Scarce. Mostly in botanic gardens.
France: Côtes, Harcourt, Maulévrie, Montpellier (Ecole d'Agriculture), Pézanin, Villa Thuret, Vilmorin.
Germany: Darmstadt Botanic Garden, Pillnitz.
Italy: Florence, Isola Bella (region of Lac Majeur).

Pinus monticola Dougl. **western white pine**

Australia: New South Wales.
Belgium: Tervueren, Three Kings Park, Virton.
British Isles: Specimen trees are fairly common, but it is not successful as a forest tree due to attacks by *Cronartium ribicola*. Ardchullary, Bagley Wood, Cluny, Corrour, Dawyck, Dropmore, Hope Toun, Murthly, Stratfield Saye, Tubney.
Denmark: Charlottenlund, Copenhagen, Egelund.
Finland: Mustila, Pekola.
France: Barres, Champeaux, Fosse, Fremont, Geneste City Park, Harcourt, Maulévrie, Vilmorin.
Germany: Augsburg, Darmstadt Botanic Garden, Grafrath, Schleswig-Holstein, Tharandt, Weinheim, Wilhelma, Wörlitz Park.
Netherlands: Schovenhorst.

Pinus muricata D. Don **bishop pine**

Australia: New South Wales, southern Australia (southeastern forests), Westbourne Woods.
British Isles: Hardy but rare. Bayfordbury, Bedgebury, Eastnor Castle, Leighton Buzzard, Nymans.
France: Barres, Champeaux, Fosse, Harcourt, Maulévrie, Pézanin, Vilmorin.
New Zealand: Fairly extensive plantings on both islands; much used for shelter belts.
North Rhodesia.
Netherlands: Schovenhorst.
South Africa: Locations unknown; planted on moderate scale in various soils and at different elevations; hardy to frost; suffers from drought.

Pinus palustris Mill. **longleaf pine**

Australia: East Australia, New South Wales, Queensland, Westbourne Woods. Better adapted to coastal conditions than any other species.
British Isles: Bagley Wood, Bedgebury, Kew, Murthly, Tubney.
Denmark: Copenhagen.
France: Barres, Bordeaux, Geneste City Park, Maulévrie, Montpellier (Ecole d'Agriculture).

Italy: Rovelli nurseries (region of Lac Majeur).
Japan: Asakawa.
New Zealand: Waipona.
North Rhodesia.
Ryukyu Islands.
South Africa: Frankenwald (Transvaal), Knysna (Midland Conservancy), Zululand (plantations).

Pinus ponderosa Laws. **Ponderosa pine**

Australia: Canberra, Hobart (Tasmania), Melbourne, New South Wales, Queensland, Victoria (Ballarat Water Commission), Westbourne Woods.
Austria: Vienna.
Belgium: Cedrogne, Court-Saint-Etienne, Gedinne, Groenendael, Nassogne, Raevels, Tervueren, Three Kings Park, Wenduyne.
British Isles: Grown in many parts of the country though not to any extent as plantation tree; best in southern England. Bagley Wood, Bayfordbury, Cluny, Dropmore, Eastnor Castle, Hope Toun, Murthly, Nymans, Stratfield Saye, Tubney.
Czechoslovakia.
Denmark: Fuglsang.
Finland: Pekola, Tammisto.
France: Barres, Champeaux, Champenoux, Côtes, Fosse, Harcourt, Martinvast, Maulévrie, Montpellier (Ecole d'Agriculture), Mt. Aigoual, Pézanin, Rennes, Sénéclauze Estate, Trianon (Ecole d'Horticulture), Villa Thuret.
Germany: Aachen, Altona, Augsburg, Bavaria (state forests), Coesfelder Berg (forest plantings), Cronberg, Dammerutz, Darmstadt Botanic Garden, Erlangen, Freienwalde a. Oder, Gadow, Grafrath, Grevenbroich, Haag Park, Hambach, Heidelberg City Forest, Hessen-Nassau, Hohenheim, Hohengehren Forstamt, Hohen-Niendorf, Kalkhorst, Magdeburg, Passau, Pförten, Prussia, Riddagshausen, Schleswig-Holstein, Schlosse Friedrichshof, Schwerin, Sophienhof, Tharandt, Weinheim, Wendisch-Wilmersdorf, Wernigerode, Wilhelma.
Hungary: Godollo.
India: Raniket.
Italy: Apennine mountains, region of the lakes.
Latvia: Riga.
Netherlands: Schovenhorst, Wageningen.
New Zealand: Successful extensively on both islands; 94,000 acres estimated. Canterbury, Erua State Forest, Hanmer Springs, South Island.
North Rhodesia.
Norway.
Poland: Glogau, Gosda, Königsberg, Oliva, Prussia.
Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Baltic Provinces.
South Africa.
Sweden: Alnarp.

Pinus ponderosa var. **arizonica** (Engelm.) Shaw **Arizona pine**

Australia: Australian Capital Territory.
India: Raniket.
North Rhodesia.
South Africa: North Transvaal (best variety).

Pinus pungens Lamb. **Table-Mountain pine**

British Isles: Bayfordbury, Nymans.
France: Barbier nurseries, Barres, Côtes, Geneste City Park, Maulévrie, Nouan.
Germany: Bavaria (11,000 in state forests).
Italy: Villa Troubetzkoy (region of Lac Majeur).
South Africa.

Pinus quadrifolia Parl. **Parry pinyon**

British Isles: Nymans.
France: Grignon, Mouillefert.

Pinus radiata D. Don **Monterey pine**

Planted extensively in South Africa, Australia, and New Zealand where it produces remarkable timber crops on short rotations in spite of heavy losses inflicted by *Diplodia pinea.*

Argentina: Buenos Aires (Province); other areas not stated.
Australia: Canberra, Fraser Island, New South Wales, Queensland, South Australia, Tasmania, Victoria, Westbourne Woods.
Belgium.
British Isles: Hardy rapid grower only in southwest England and along coast; soldom used as plantation tree. Abundant in Ireland. Bayfordbury, Bedgebury, Benmore, Bicton, Colesborne, Cuffnells, Curraghmore, Dropmore, Dunster, Heckfield Place, Longleat, New Forest, Nymans, Penrhyn, Powerscourt, Tubney.
Chile: In south 49,000 acres; location unknown.
France: Barres, Brest Marine Gardens, Cherbourg (several parks), Côtes, Keranflech, Martinvast, Maulévrie, Montpellier (Ecole d'Agriculture), Morlaix, Prafrance, Villa Thuret, Vilmorin.
Germany: Dörenthe, Grafrath.
Italy: Apennine mountains, region of Lac Majeur.
Kenya: A few trees showing promise; location unknown.
Madeira Island (Africa): Abundant; locations unknown.
New Zealand: Extensively planted at 1,500 to 2,500 feet; easily established, rapid-growing; 500,000 acres estimated. Canterbury, Hanmer Springs, South Island.
North Rhodesia.
Nyasaland: Unsuccessful.
Portugal: Bussaco, Coimbre.
Ryukyu Islands.
South Africa: Cape Colony, Frankenwald (Transvaal), Midland Conservancy (extensively planted).
South Rhodesia: Location unknown; grows best at 5,000 feet and higher with adequate rainfall.
Spain: Guipúzcoa; also large plantations made—locations not stated.
Switzerland.
Uruguay: San Jorge.

Pinus resinosa Ait. **red pine** ("Norway pine")

Australia: Victoria (8 acres).
Belgium: Tervueren.
British Isles: Occasional specimen tree; not promising for plantation purposes. Bayfordbury, Bedgebury, Dropmore, Kew.
Czechoslovakia.

Denmark.
France: Barres, Champeaux, Pezanin, Vilmorin.
Germany: Wörlitz Park.
New Zealand: Promising; locations unknown.
Poland: Glogau.
Romania: Hatarmajor.

Pinus rigida Mill. **pitch pine**

Australia: Westbourne Woods.
Austria: 3 areas (68,600 trees, locations unknown) planted in state and communal forests.
Belgium: Arendonck, Brasschaet, Cedrogne, Gedinne, Hertogenwald, St. Michel.
British Isles: Hardy, but growth not good enough to use as forest tree. Dropmore, Murthly, Nymans.
Denmark: Charlottenlund, Copenhagen, Häsede, Sölestedgaard.
France: Barbier nurseries, Barres, Catros, Côtes, Geneste City Park, Harcourt, Keranflech, Maulévrie, Mt. Aigoual, Sénéclauze Estate.
Germany: Augsburg, Baden-Baden, Bavaria (state forests, 69,000 trees), Coesfelder Berg (forest plantings), Cologne Botanic Garden, Cronberg, Darmstadt Botanic Garden, Eberswalde, Erlangen, Freienwalde a. Oder, Gadow, Grafrath, Heidelberg City Forest, Kattmannskamp, Kromlau, Lousberg Villa, Muskau, Passau, Pförten, Prussia, Riddagshausen, Schlemmin, Schleswig-Holstein, Schwarzwald, Sophienhof, Weinheim, Wörlitz Park.
Japan: Asakawa.
Latvia: Riga.
Netherlands: Schovenhorst, Wageningen.
Poland: Danzig, Glogau, Gosda.
Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Baltic provinces, Bryansk region, Ukraine.
South Africa: Small-scale trials, locations unknown; not drought hardy; generally not worth growing.
Sweden: Alnarp, Stockholm.
Switzerland: Lucerne.

Pinus sabiniana Dougl. **Digger pine**

Australia: Hobart (Tasmania), Victoria, Westbourne Woods.
Austria: Vienna.
Belgium: Ardennes, Tervueren.
British Isles: Very rare; not hardy; adapted only to milder parts of Britain. Bayfordbury, Nymans.
France: Barres, Champeaux, Fosse, Limoges, Montpellier (Ecole d'Agriculture), Nimes, Pézanin, Rennes, Sénéclauze Estate, Villa Thuret, Vilmorin.
Germany: Darmstadt Botanic Garden, Dörenthe, Wörlitz.
India.
Italy: Region of Lac Majeur, in several places.
Russia: Soukhoum.
South Africa: Location unknown; very hardy, fairly fast growing.

Pinus serotina Michx. **pond pine**

British Isles: Very rare, not well adapted to Britain. Bayfordbury, Nymans.

Pinus strobus L. **eastern white pine**

Australia: New South Wales, Victoria, Westbourne Woods.

Austria: 20 areas (16,400 trees locations unknown); planted in state and communal forests.

Belgium: Antwerp (Campine), Ardennes Belle-Étoile (Soignes Forest), Brasschaet, Cedrogne, Gedinne, Gooreynd, Grand Bois, Groenhove, Hertogenwald, Héverlé, Louvain, Louvenjoul, Luxembourg Park, St. Michel, Sept-Fontaines, Tervueren, Three Kings Park, Vogelsanck Park, Zangerey.

British Isles: Hardy; little used for plantations because of blister rust; once widely and successfully grown in Great Britain. Bagley Wood, Balmoral, Bedgebury, Benmore, Colesborne, Dunach, Hope Toun, London, Longleat, Maiden Bradley Wood, Murthly, New Forest, Novar Estate, Nymans, Penrhyn, Tavistock Woods, Tring, Tubney, Windsor Forest.

Chile.

Czechoslovakia.

Denmark: Copenhagen, Häsede, Sölestedgaard.

Estonia: Tartu.

Finland: Mustila, Pekola, Tammisto.

France: Barbier nurseries, Barres, Catros, Champeaux, Fremont, Geneste City Park, Harcourt, Limoges, Maulévrie, Mt. Aigoual, Prafrance, Trianon (Ecole d'Horticulture), Versailles (Petit Trianon), Vilmorin.

Germany: Altona, Augsburg, Baden-Baden, Badenweiler, Bavaria (state forests had 15 million), Braunfels, Buddenhagen, Cleve, Cronberg, Dammerutz, Eberswalde, Eisenach, Erfurt Forest, Erlangen, Falkenstein, Frankfurt a. Oder, Fürstlich Drehna, Gadow, Gracht, Grafrath, Grambow, Harbke Park, Harzburg, Heidelberg City Forest, Hessen-Nassau (Wilhelmshöhe), Hohengehren Forstamt, Hohenheim, Hohen-Niendorf, Kalkhorst, Karlsruhe, Kattmannskamp, Kromlau, Lehrte, Lindau, Lousberg, Villa, Ludwigslust, Marienhof, Moselle, Münster, Muskau, Nürnberg, Passau, Pforten, Pillnitz, Schleswig-Holstein, Schwarzwald, Schwerin, Seebach, Sophienhof, Teltow, Tharandt, Trier, Tübingen, Weimar, Weinheim, Wendisch-Wilmersdorf, Wiesbaden, Wilhelma, Wörlitz Park.

Hungary: Godollo.

Italy: Apennine mountains, Isola Bella (region of Lac Majeur).

Japan: Asakawa, Tokyo University Forest.

Latvia: Riga.

Lithuania.

Netherlands: Arnhem, Landfort, Schovenhorst, Vogelzanck.

New Zealand: Erua State Forest, Hanmer Springs, North Island, Rotorua.

Norway: Christiana; other locations unknown.

Poland: Beuthen, Danzig, Gleiwitz, Glogau, Königsberg, Oliva, Prussia, Sagan, Zielonka State Forests.

Portugal: Bussaco.

Romania: Hatarmajor, Neagratal.

Russia: Bryansk region, Cernymi Lesy Forest, Kostelec Forest, Mohkovsk District, Moscow, Tambov-Ryazan Region, Ukraine.

South Africa.

Sweden: Stockholm.

Switzerland: Baden, Bremgartenwald, Fribourg, Langenthal, Lenzbourg, Morat, Neuchatel Canton, Rütiwald, Vaud Canton, Witen, Zofingen.

Yugoslavia.

Pinus taeda L. **loblolly pine**

Australia: Fraser Island, New South Wales, Queensland, South and Western Australia, Westbourne Woods.
British Isles: Bayfordbury, Bedgebury.
France: Barres, Bordeaux, Geneste City Park, Rennes Botanic Garden, Vilmorin.
Germany: Dörenthe, Riddagshausen.
India: Kulu.
Japan: Asakawa.
Mauritius: Location unknown; does well at 1,200 feet with adequate rainfall.
New Zealand: Waipona.
North Rhodesia.
Portugal: Bussaco.
Romania: Hatarmajor.
Ryukyu Islands.
South Africa: Knysna, Zululand.
South Rhodesia: Locations unknown; grows best at 5,000 feet with adequate rainfall.

Pinus torreyana Parry **Torrey pine**

Australia: Westbourne Woods.
British Isles: Bayfordbury, Kew, Nymans.
France: Barres, Maulévrie, Pézanin, Vilmorin.
New Zealand: Christchurch, Rotorua.
Portugal: Bussaco.

Pinus virginiana Mill. **Virginia pine**

British Isles: Very scarce; has no commercial value in Britain. Bayfordbury, Nymans, Tortworth.
France: Barres, Fremont, Geneste City Park, Maulévrie, Pézanin, Vilmorin.
Germany: Schlemmin.
Norway.
Poland: Königsberg.
Portugal: Bussaco.
Russia: Moscow.
Ryukyu Islands.

Planera aquatica Gmel. **planertree**

France: Barres.
Germany: Giessen, Karlsruhe.

Platanus occidentalis L. **American sycamore**

Belgium: Gooreynd, Héverlé, Nassogne, St. Michel, Tervueren, Waremme.
British Isles: Tender; no trees of any size; very rare in Europe. Cluny, London (scarce and poor).
Denmark: Aalholm.
France: Barres, Maulévrie, Metz, Pézanin.
Germany: Biebrich, Cologne, Destedt Park, Frankfurt a. Oder, Heidelberg Kalkhorst, Lake Constance, Lindau, Mettlach, Potsdam, Prussia, Schwerin, Weinheim, Wissen.
Italy: Apennine mountains.
Japan: Asakawa.
Poland: Olivia.

Platanus wrightii S. Wats. **Arizona sycamore**

South Africa: Location unknown; growing well as a street and ornamental tree.

Populus angustifolia James **narroleaf cottonwood**

Belgium: Tervueren.
British Isles: Kew.
France: Barres.

Populus balsamifera L. **balsam poplar**

Belgium: Tervueren.
British Isles: Widely grown in England as ornamental; useless for timber.
Bulgaria.
Denmark: Copenhagen.
France: Barres, Bois de Boulogne.
Germany: Altona, Buddenhagen, Cannstatt, Cologne Botanic Garden, Destedt Park, Scharfenberg, Schwerin.
Latvia: Riga.
Norway: Tröndelag County, location unknown.
Russia: Bryansk region, Ukraine.
South Africa: Still under trial in various zones; location unknown.

Populus ×canadensis Moench **Carolina poplar**

Belgium: Tervueren.
Germany: Cologne, Erlangen, Gadow, Magdeburg, Prussia, Weinheim.
Latvia: Riga.
Netherlands.
Portugal: Cintra-Pena
Switzerland.

Populus deltoides Bartr. **eastern cottonwood**

Belgium: Abundantly distributed in this country. Court-Saint-Etienne, Waremme.
British Isles: Widely planted. Bicton, London, Tubney.
Denmark: Copenhagen.
France: Barres, Bois de Boulogne, Metz, Prafrance, Vilmorin.
Germany: Altona, Augsburg, Baden-Baden, Eisenach, Muskau, Prussia, Weinheim.
India: Kulu.
Japan: Asakawa.
Latvia: Riga.
Netherlands.
Norway.
Romania: Hatarmajor (plantations).
South Africa.
South Rhodesia: Location unknown; grows best at 5,000 feet and higher.

Populus fremontii S. Wats. **Fremont cottonwood**

British Isles: Glasnevin, Kew.
Denmark: Copenhagen Botanic Garden.
Poland: Königsberg.

Populus fremontii var. **wislizenii** S. Wats. **Rio Grande cottonwood**

France: Barres.

South Africa: Location unknown; hardy to frost; shows good growth even on dry sites; planted mainly as street and ornamental tree.

Populus grandidentata Michx. **bigtooth aspen**

Belgium: Tervueren.

British Isles: Grayswood (England only)

France: Barres, St. Mandé (Ecole d'Arboriculture)

Populus tremuloides Michx. **quaking aspen**

Belgium: Tervueren.

France: Barres, Metz.

Germany: Muskau.

Poland: Königsberg.

Populus trichocarpa Torr. & Gray **black cottonwood**

Belgium: Tervueren.

British Isles: Grown since 1892 but only in arboreta and gardens; hardy, fast growing. Dawyck, Edinburgh, Grayswood, Kew, London.

Denmark: Copenhagen Botanic Garden.

France: Barres, Cotros.

Germany: Römerpark, Wendisch-Wilmersdorf.

Iceland.

Norway.

Poland: Gleiwitz, Königsberg.

South Africa: Location unknown; still under trial in various zones.

Prosopis juliflora (Sw.) DC. **mesquite**

Cyprus: Locations unknown; introduced 1918; grows well in protected areas in rich loam; drought resistant.

Nigeria: Promising; locations unknown.

Pakistan: Of great value in afforestation work; drought resistant. Baluchistan, Punjab, Sind.

Ryukyu Islands.

South Africa: Location unknown; hardy, grows well.

Prosopis pubescens Benth. **screwbean mesquite**

South Africa: Location unknown; grown in similar locations as *P. juliflora* but on smaller scale.

Prunus americana Marsh. **American plum**

Germany: Wendisch-Wilmersdorf.

Prunus angustifolia Marsh. **Chickasaw plum**

France: Barres.

Prunus besseyi Bailey **Bessey cherry**

British Isles: East Malling.

Germany: Wendisch-Wilmersdorf.

Prunus emarginata Dougl. **bitter cherry**

France: Barres.

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Prunus ilicifolia (Nutt.) D. Dietr. **hollyleaf cherry**

France: Barres, Vilmorin.

Prunus maritima Marsh. **beach plum**

France: Barres.

Prunus nigra Ait. **Canada plum**

Germany: Hamburg Botanic Garden, Wendisch-Wilmersdorf.

Prunus pensylvanica L. f. **pin cherry**

France: Barres.
Germany: Darmstadt Botanic Garden, Muskau.
Poland: Königsberg.

Prunus pumila L. **sand cherry**

France: Barres, Vilmorin.
Germany: Scharfenberg.

Prunus serotina Ehrh. **black cherry**

Austria: 1 area (500 trees, location unknown); planted in state and communal forests.
Belgium: Campine, Cedrogne, Gedinne, Gooreynd, Groenendael, Lanklaer, St. Michel, Tervueren.
British Isles: Planted for forestry tests, Scotland and England. Tubney.
Denmark: Copenhagen.
Finland: Tammisto.
France: Barbier nurseries, Barres, Bois de Boulogne, Caën, Catros, Champeaux, Champenoux, Geneste City Park, Harcourt, Limoges, Maulévrie, Metz, Mt. Aigoual, Nice, Rennes, Sénéclauze Estate.
Germany: Altendöbern, Altona, Augsburg, Baden-Baden, Barnstorf, Bavaria (state forests had 1,000), Braunfels, Buddenhagen, Cannstatt, Cologne City Forest, Cronberg, Eberswalde, Frankfurt a. Main, Gadow, Grafrath, Hambach, Harzburg, Heidelberg City Forest, Hohen-Niendorf, Kattmannskamp, Kromlau, Lousberg Villa, Magdeburg, Muskau, Nürnberg, Passau, Potsdam, Prussia, Riddagshausen, Schleswig-Holstein, Seebach, Sophienhof, Weinheim, Wendisch-Wilmersdorf.
Latvia: Riga.
Netherlands: Vogelzanck.
Poland: Danzig, Gleiwitz, and western section.
Russia: Bryansk region.
Switzerland.

Prunus serotina var. **alabamensis** (Mohr) Little **Alabama black cherry**

France: Barres.

Prunus virginiana L. **common chokecherry**

Belgium: Capucins, Cedrogne, Court-Saint-Etienne, Raevels.
Denmark: Copenhagen.
Finland: Tammisto.
France: Barres, Metz, Vilmorin.
Germany: Cannstatt, Cologne, Hamburg Botanic Garden, Hohen-Niendorf, Karlsruhe, Lousberg Villa, Magdeburg, Schwerin.
Latvia: Riga.
Norway: Tröndelag County, location unknown.
Russia: Bryansk region.

Prunus virginiana var. **demissa** (Nutt.) Torr. **western chokecherry**

Germany: Lousberg Villa.

Pseudotsuga macrocarpa (Vasey) Mayr **bigcone Douglas-fir**

Belgium: Tervueren.
British Isles: Bayfordbury, Bedgebury.
France: Barres, Harcourt.
Germany: Grafrath, Tübingen.

Pseudotsuga menziesii (Mirb.) Franco **Douglas-fir**

Australia: Not very promising; slow-growing, adversely affected by dry winds and frosts; shows great promise on good sites on Mt. Lofty range. Australian Capital Territory, Melbourne, New South Wales, South Australia, Tasmania, Victoria, Western Australia.

Austria: Locations unknown; 89 areas (93,335 trees) planted in state and communal forests.

Belgium: Antwerp (Campine), Ardennes, Assenois, Beernem, Belle-Étoile, Bloemendael, Capucins, Cedrogne, Court-Saint-Etienne, Gedinne, Grand Bois, Groenhove, Lanklaer, Louvenjoul, Luxembourg Park, Meerdael, Nassogne, Raevels, St. Michel, Tervueren, Three Kings Park, Vogelsanck Park.

British Isles: Extensively planted; the tallest tree of Britain is of this species; thrives best on good sites with rainfall 28 to 80 inches. Ardchullary, Bagley Wood, Balmoral, Bedgebury, Benmore, Bicton, Brahan, Cluny Castle, Colesborne, Dalforgan, Dawyck, Denbighshire, Dropmore, Dunach, Dunster Estate, Durris, Fulmodestone Wood, Glendye Woods, Hatfield Estate, Heckfield Place, Hope Toun, Hursley Park, Lake Vyrnwy, London, Longleat, Maiden Bradley Woods, Moorburnhead plantation, Murthly, New Forest, Novar Estate, Nymans, Penrhyn, Powerscourt, Powis Castle, Somerset County Lands, Stanley, Stourhead, Stratfield Saye, Tortworth, Tring, Tubney.

Czechoslovakia: Forest plantings, pure and mixed. Kysihybli Arboretum.

Denmark: Aalholm, Copenhagen, Fuglsang, Gisselfeld, Hindsgavl, Langdal, Langesoe, Solestedgaard.

Estonia: Tartu.

Finland: Helsingfors, Tammisto.

France: Amance, Barbier nurseries, Barres, Catros, Champeaux, Champenoux, Fremont, Geneste City Park, Harcourt, Keranflech, Limoges, Morlaix, Mt. Aigoual, Nouan, Rennes Botanic Garden, Sénéclauze Estate, Strasbourg, Trianon (Ecole d'Horticulture), Versailles (Petit Trianon), Vilmorin.

Germany: Altona, Baden-Baden, Badenweiler, Bamberg, Bavaria (1,000,000 in state forests), Buddenhagen, Cleve, Coesfelder Berg (forest plantings), Cologne, Cronberg, Dahlem, Dörenthe Eberswalde, Erfurt Forest, Erlangen, Fürstlich Drehna, Gadow, Gracht, Grafrath, Haag Park, Hambach, Hamburg, Harburg, Harzburg, Heidelberg City Forest, Hohengehren Forstamt, Hohenheim, Hohen-Niendorf, Lehrte, Kaartz, Kalkhorst, Kattmannskamp, Kromlau, Lindau, Lousberg Villa, Magdeburg, Marienhof, Nürnberg, Passau, Pförten, Pillnitz, Potsdam, Prussia, Reinhardtsbrunn Riddagshausen, Scharfenberg, Schlemmin, Schleswig-Holstein, Schwarzwald, Schwerin, Seebach, Teltow, Tharandt, Weinheim, Wendisch-Wilmersdorf, Wörlitz, Wurttemberg.

Hawaii.
India: Kulu, Punjab.
Italy: Region of Lac Majeur—everywhere.
Japan: Asakawa.
Luxembourg.
Netherlands: Arnhem, Het Loo, Schovenhorst.
New Zealand: Estimated 54,000 acres; successful at 1,000–5,000 feet with rainfall of 40 to 60 inches. Canterbury, Erua State Forest, Hanmer Springs, South Island.
Norway: Söfteland, south of Bergen.
Poland: Allenstein, Danzig, Freienhuben, Gleiwitz, Glogau, Sagan, Zielonka State Forests.
Portugal: Bussaco, Cintra-Pena.
Russia: Bryansk region, Cernymi Lesy, Kostelec, Moscow.
South Africa: Locations unknown; some older plantations fairly promising; not likely to become of commercial importance.
Sweden: Jönköping, Lund, Stockholm.
Switzerland: Bienne (Vaud Canton), Lucerne, Zurich.
Yugoslavia.

Pseudotsuga menziesii var. **glauca** (Beissn.) Franco — **Rocky Mountain Douglas-fir**

Austria: Vienna.
Belgium: Gedinne, Tervueren.
British Isles: Bedgebury, Duns Castle, Kew.
Denmark: Charlottenlund, Copenhagen.
Finland: Helsingfors, Mustila, Pekola.
France: Barres, Caën, Harcourt, Maulévrie, Metz, Mt. Aigoual, Nouan, Prafrance.
Germany: Augsburg, Frankfurt a. Oder, Grafrath, Seebach, Tharandt, Wendisch-Wilmersdorf, Wiesbaden, Wörlitz Park.
Hungary: Godollo.
Italy: Villa Barbo (region of Lac Majeur).
Latvia: Riga.
Netherlands: Schovenhorst.
Romania: Hatarmajor.
Russia: Bryansk region, Moscow.
Sweden.
Switzerland.

Ptelea baldwinii Torr. & Gray — **Baldwin hoptree**

France: Barres.

Ptelea nitens Greene — **shiny hoptree**

France: Barres.

Ptelea polyadenia Greene — ——

France: Barres.

Ptelea trifoliata L. — **common hoptree**

Belgium: Sept-Fontaines.
British Isles: Nymans.
France: Barres, Champeaux, Vilmorin.
Germany: Augsburg, Cannstatt, Cologne, Destedt Park, Kalkhorst, Magdeburg, Seebach, Wendisch-Wilmersdorf.

Japan: Asakawa.
Latvia: Riga.
Poland: Beuthen, Danzig, Freienhuben, Gleiwitz, Glogau, Königsberg.
Russia: Bryansk region.

Purshia tridentata (Pursh) DC. **antelope bitterbrush**

France: Barres.
Germany: Darmstadt Botanic Garden.

Quercus agrifolia Née **California live oak**

British Isles: Kew.
France: Barres.

Quercus alba L. **white oak**

Austria: Vienna.
Belgium: Lanklaer, Tervueren.
British Isles: Tortworth.
Denmark: Häsede.
France: Barres, Fosse, Maulévrie, Toulouse, Vilmorin.
Germany: Badenweiler, Coesfelder Berg, Hamburg Botanic Garden, Karlsruhe, Lousberg Villa, Muskau, Pförten, Rosenstein Park, Weinheim, Wendisch-Wilmersdorf.
Poland: Beuthen.
Romania: Hatarmajor.
Russia: Ukraine.

Quercus arkansana Sarg. **Arkansas oak**

France: Barres.

Quercus×bebbiana Schneid. **Bebb oak**

France: Barres.

Quercus bicolor Willd. **swamp white oak**

Austria: Vienna.
Belgium: Lanklaer, Tervueren.
British Isles: Coombe Wood, Kew, Syon House.
France: Barres, Champeaux, Fosse, Geneste City Park, Prafrance, Vilmorin.
Germany: Cologne Botanic Garden, Potsdam.
Romania: Hatarmajor.
Russia: Ukraine.

Quercus coccinea Muenchh. **scarlet oak**

Belgium: Bloemendael, Gedinne, Lanklaer, Nassogne, Tervueren.
British Isles: Briton Ferry, New Forest, Nymans, Syon House, Tring.
Denmark: Copenhagen, Hardenberg.
Finland: Helsingfors, Tammisto.
France: Barres, Catros, Champeaux, Côtes, Geneste City Park, Harcourt, Limoges, Maulévrie, Mt. Aigoual.
Germany: Altona, Augsburg, Buddenhagen, Cologne, Darmstadt Botanic Garden, Destedt Park, Fürstlich Drehna, Gadow, Giessen, Grafrath, Hamburg Botanic Garden, Heidelberg City Forest, Hohen-Niendorf, Kromlau, Lörsfeld, Lousberg Villa, Ludwigslust, Magdeburg, Schwerin, Sophienhof, Wienheim.
Italy: Appennine mountains, Villa Troubetzkoy (region of Lac Majeur).
Latvia: Riga.

Netherlands.
Poland: Danzig, Freienhuben, Gleiwitz, Glogau, Königsberg.
Portugal: Bussaco.
Romania: Hatarmajor.
Sweden: Alnarp.

Quercus×deamii Trel. **Deam oak**

France: Barres.

Quercus douglasii Hook. & Arn. **blue oak**

Belgium: Tervueren.

Quercus falcata Michx. **southern red oak**

British Isles: Kew, Nymans.
France: Barres, Geneste City Park, Prafrance, Vilmorin.
Germany: Muskau.
Italy: Villa Troubetzkoy (region of Lac Majeur).

Quercus gambelii Nutt. **Gambel oak**

France: Barres.

Quercus garryana Dougl. **Oregon white oak**

Belgium: Tervueren.
France: Côtes.
Germany: Darmstadt Botanic Garden.

Quercus×heterophylla Michx. f. **Bartram oak**

British Isles: Kew
France: Barbier nurseries, Barres, Maulévrie, Verrieres.
Germany: Tannenhöft.

Quercus ilicifolia Wangenh. **bear oak**

British Isles: Kew, Tortworth, Westonbirt.
Denmark: Charlottenlund, Copenhagen.
France: Barres, Côtes, Geneste City Park, Mt. Aigoual, Toulouse, Vilmorin.
Germany: Augsburg, Muskau, Pförten.
Russia: Ukraine.
Sweden: Alnarp.

Quercus imbricaria Michx. **shingle oak**

Belgium: Lanklaer.
British Isles: Not common.
Denmark: Charlottenlund, Copenhagen.
France: Barbier nurseries, Barres, Fosse, Limoges, Maulévrie, Rennes, Toulouse.
Germany: Augsburg, Barnstorf, Cronberg, Darmstadt Botanic Garden, Eisenach, Fürstlich Drehna, Hamburg Botanic Garden, Kromlau, Lousberg Villa, Mainau Island, Nürnberg, Riddagshausen, Schwerin, Tannenhöft.
Italy: Villa Troubetzkoy (region of Lac Majeur).
Poland: Danzig, Freienhuben, Glogau, Königsberg.
Romania: Hatarmajor.
Russia: Ukraine.
Sweden: Alnarp.

Quercus incana Bartr. **bluejack oak**

British Isles: Extremely rare. Kew.

Quercus × jackiana Schneid. **Jacks oak**

France: Barres.

Quercus kelloggii Newb. **California black oak**

British Isles: Rare. Kew, Tortworth.
France: Barres.

Quercus laevis Walt. **turkey oak**

France: Geneste City Park.
Germany: Destedt Park.

Quercus laurifolia Michx. **laurel oak**

France: Barres, Geneste City Park, Maulévrie.
Poland: Danzig, Freienhuben.

Quercus × leana Nutt. **Lea oak**

British Isles: Kew.
France: Barres.

Quercus lobata Née **California white oak**

British Isles: Not successful. Kew.
France: Barres, Maulévrie.

Quercus lyrata Walt. **overcup oak**

British Isles: Kew.
France: Barres.
Germany: Destedt Park.
Russia: Ukraine.

Quercus macrocarpa Michx. **bur oak**

Austria: Vienna; also 2 areas (600 trees) planted in state and communal forests.
Belgium: Gedinne, Lanklaer, Sept-Fontaines, Tervueren.
British Isles: Eastnor Castle, Fota, Kew.
France: Barres, Bois de Boulogne, Côtes, Maulévrie, Metz, Montpellier, Mt. Aigoual, Schlumberger, Toulouse, Trianon (Ecole d'Horticulture), Vilmorin.
Germany: Aachen, Augsburg, Cologne City Garden, Destedt Park, Dörenthe, Frankfurt a. Main, Hamburg Botanic Garden, Hohenheim, Lousberg Villa, Muskau, Pillnitz, Schwerin, Tannenhöft, Wiesbaden.
Latvia: Riga.
Netherlands: Landfort.
Poland: Beuthen, Danzig, Freienhuben, Glogau, Königsberg.
Romania: Hatarmajor.
Russia: Bryansk region, Ukraine.
Spain: Madrid.
Yugoslavia.

Quercus marilandica Muenchh. **blackjack oak**

British Isles: Rare and short lived. Nymans.
France: Barres.
Germany: Darmstadt Botanic Garden, Magdeburg, Muskau, Tannenhöft.

Quercus michauxii Nutt. **swamp chestnut oak**

France: Barres.
Germany: Tannenhöft.

Quercus nigra L. **water oak**

Belgium: Lanklaer.
British Isles: Not common. Kew, Nymans.
France: Barbier nurseries, Barres, Geneste City Park, Limoges, Maulévrie.
Germany: Augsburg, Muskau, Lousberg Villa, Riddagshausen.
Poland: Danzig, Freienhuben.

Quercus palustris Muenchh. **pin oak**

Australia: Australian Capital Territory.
Austria: Locations unknown; planted in state and communal forests.
Belgium: Bloemendael, Campine, Cedrogne, Gedinne, Gooreynd, Hertogenwald, Lanklaer, Luxembourg Park, Nassogne, St. Michel, Tervueren, Zangerey.
Brazil.
British Isles: Grows better in England than any American oak except *Q. rubra;* occasional trees planted for ornament because of beautiful foliage. Nymans, Syon House, Tortworth.
Nymans, Syon House, Tortworth.
Denmark: Hardenberg, Häsede, Holstenhuus.
Finland: Helsingfors, Tammisto.
France: Amance, Beleine, Barbier nurseries, Barres, Bois de Boulogne, Caën, Catros, Champeaux, Champenoux, Côtes, Fosse, Geneste City Park, Harcourt, Limoges, Maulévrie, Metz, Nouan, Rennes Botanic Garden, Sénéclauze Estate, Tarbes, Toulouse, Verrieres, Vilmorin.
Germany: Augsburg, Bavaria (15,000 in state forests), Buddenhagen, Cologne Botanic Garden, Cleve, Cronberg, Dammerutz, Darmstadt Botanic Garden, Dilborn, Erlangen, Falkenstein, Fürstlich Drehna, Gadow, Grafrath, Grambow, Haag Park, Hohen-Niendorf, Karlsruhe, Kattmannskamp, Kromlau, Ludwigslust, Magdeburg, Maskau, Odelsheim Oberforst, Reinhardtsbrunn, Riddagshausen, Scharfenberg, Schleswig-Holstein, Schwerin, Sophienhof, Teltow, Weinheim, Wörlitz.
Italy: Villa Troubetzkoy (region of Lac Majeur).
Japan: Asakawa.
Latvia: Riga.
Netherlands: Landfort, Vogelzanck.
Poland: Beuthen, Danzig, Freienhuben, Gleiwitz, Glogau, Gosda, Königsberg.
Portugal: Bussaco.
Russia: Ukraine.
South Africa: Location unknown; thrives well in heavy soils.
Sweden: Alnarp.
Yugoslavia.

Quercus phellos L. **willow oak**

Belgium: Brasschaet, Laeken, Lanklaer, Louvenjoul, Vogelsanck Park.
British Isles: Nymans.
France: Baleine, Barbier nurseries, Barres, Caën, Catros, Champeaux, Côtes, Geneste City Park, Maulévrie, Prafrance, Rennes, Toulouse, Vilmorin.
Germany: Augsburg, Cleve, Cologne, Fürstlich Drehna, Hamburg Botanic Garden, Heidelberg City Forest, Karlsruhe, Lousberg Villa, Magdeburg, Muskau, Potsdam, Riddagshausen, Schleswig-Holstein, Teltow, Wörlitz.

Netherlands: Vogelzanck.
Poland: Danzig, Freienhuben, Gleiwitz.

Quercus prinoides Willd. **dwarf chinkapin oak**

British Isles: Very rare. Kew, Tortworth.

Quercus prinus L. **chestnut oak**

Austria: Vienna.
Belgium: Lanklaer, Louvain, Tervueren.
British Isles: Not successful. Kew.
Denmark: Sölestedgaard.
France: Barbier nurseries, Barres, Bois de Boulogne, Catros, Champeaux, Fosse, Maulévrie, Toulouse, Trianon (Ecole d'Horticulture).
Germany: Augsburg, Destedt Park, Dyck, Giessen, Hohenheim, Mettlach, Muskau, Wörlitz.
Netherlands: Arnhem.
Poland: Königsberg.
Romania: Hatarmajor.
Russia: Ukraine.

Quercus reticulata Humb. & Bonpl. **netleaf oak**

South Africa: Location unknown. Some good trees (from 1910) are growing.

Quercus rubra L. **northern red oak**

American red oak is the most widely and extensively planted deciduous exotic in western Europe. *Robinia pseudoacacia* may be distributed as widely, but its main timber stands are concentrated largely in Romania and Hungary.

Austria: Locations unknown; 45 areas (66,800 trees) planted in state and communal forests.
Belgium: Beernem (avenue borders) Bloemendael, Brasschaet, Campine, Gedinne, Gooreynd, Groenendael, Groenhove, Laeken, Lanklaer, Luxembourg Park, Meerdael, Raevels, St. Michel, Tervueren, Three Kings Park, Vogelsanck, Waremme, Zangerey.
British Isles: Usually planted as ornamental but may have silvicultural value on light soils. Beaufort Castle, Colesborne, Killerton, Tortworth, Tubney.
Denmark: Aalholm, Häsede.
Estonia: Tartu.
Finland: Helsingfors, Mustila, Tammisto.
France: Amance, Barbier nurseries, Barres, Bois de Boulogne, Catros, Champeaux, Champenoux, Côtes, Fosse, Fremont, Geneste City Park, Harcourt, Keranflech, Limoges, Maulévrie, Metz, Morlaix, Mt. Aigoual, Nimes, Nouan, Rennes Botanic Garden, Schlumberger, Sénéclauze Estate, Tarbes, Toulouse, Versailles (Petit Trianon) Villa Thuret.
Germany: Aachen, Altona, Augsburg, Baden-Baden (177 hectares in 1906), Bamberg, Barnstorf, Bavaria (large plantings), Braunfels, Buddenhagen, Cleve, Cologne City Forest, Dyck, Eberswalde, Elberbarg, Erlangen, Falkenstein, Frankfurt a. Oder, Fürstlich Drehna, Gadow, Giessen, Gracht, Grafrath, Haag Park, Hambach, Hamburg Botanic Garden, Harbke Park, Heidelberg City Forest, Hohenheim, Hohen-Niendorf, Kaartz, Karlsruhe, Kattmannskamp, Kromlau, Lindau, Lousberg Villa, Ludwigslust, Magdeburg, Mettlach, Münster, Muskau, Nürnberg, Prussia (100 acres in 1900), Putbus, Ralswiek, Reinhardtsbrunn, Riddagshausen, Röttgen, Scharfenberg, Schlemmin, Schleswig-Holstein, Schwerin, Sophienhof, Teltow, Weinheim, Wendisch-Wilmersdorf, Wörlitz.

Italy: Apennine mountains, region of Lac Majeur.
Latvia: Riga.
Luxembourg.
Netherlands: Landfort.
Poland: Allenstein, Danzig, Gleiwitz, Glogau, Gosda, Königsberg, Prussia.
Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Bryansk region, Ukraine.
Sweden: Alnarp.
Switzerland: Lenzburg, Lucerne, Zofingen, Zurich.
Yugoslavia.

Quercus shumardii Buckl. **Shumard oak**

British Isles: Kew.

Quercus shumardii var. **texana** (Buckl.) Ashe **Texas oak**

Germany: Tannenhöft.

Quercus stellata Wangenh. **post oak**

France: Barres, Maulévrie.
Germany: Muskau, Weinheim.
Romania: Hatarmajor.

Quercus velutina Lam. **black oak**

Belgium: Gedinne, Sept-Fontaines, Tervueren, Zangerey.
British Isles: Not common. Grows well in south England. Killerton, Syon House, Tortworth.
Denmark: Charlottenlund, Copenhagen.
France: Barbier nurseries, Barres, Bois de Boulogne, Côtes, Geneste City Park, Maulévrie, Metz, Toulouse.
Germany: Augsburg, Badenweiler, Buddenhagen, Dyck, Gadow, Hohen-Niendorf, Kromlau, Muskau, Pförten, Ralswiek, Riddagshausen, Schleswig-Holstein, Sophienhof, Tannenhöft.
Poland: Danzig, Freienhuben, Glogau, Königsberg.
Russia: Ukraine.

Quercus virginiana Mill. **live oak**

Cuba.
France: Montpellier, Villa Thuret.
Spain.

Quercus wislizenii A. DC. **interior live oak**

British Isles: Kew.

Rhamnus californica Eschsch. **California buckthorn**

France: Mouillefert, Vilmorin.

Rhamnus caroliniana Walt. **Carolina buckthorn**

British Isles: Nymans.
Denmark: Copenhagen Botanic Garden.
France: Barres.

Rhamnus crocea Nutt. **hollyleaf buckthorn**

France: Barres.

Rhamnus purshiana DC. — **cascara buckthorn**
British Isles: Nymans.
France: Barres.

Rhododendron calendulaceum (Michx.) Torr. — **flame azalea**
British Isles: Nymans

Rhododendron canadense (L.) Torr. — **rhodora**
British Isles: Nymans.
France: Vilmorin.

Rhododendron catawbiense Michx. — **Catawba rhododendron**
Germany: Dyck, Heidelberg, Potsdam.
Latvia: Riga.

Rhododendron macrophyllum D. Don — **Pacific rhododendron**
Germany: Weinheim.

Rhododendron maximum L. — **rosebay rhododendron**
Germany: Heidelberg.
Italy.

Rhododendron nudiflorum (L.) Torr. — **pinxterbloom azalea**
France: Barres.

Rhododendron occidentale (Torr. & Gray) A. Gray — **western azalea**
British Isles: Nymans.

Rhododendron vaseyi A. Gray — **pinkshell azalea**
British Isles: Nymans.
France: Barres, Vilmorin.

Rhododendron viscosum var. **glaucum** (Ait.) Torr. — **blueleaf swamp azalea**
France: Barres.

Rhus aromatica Ait. — **fragrant sumac**
France: Barres.
Germany: Karlsruhe.
Romania: Hatarmajor.

Rhus copallina L. — **shining sumac**
France: Barres.
Romania: Hatarmajor.

Rhus glabra L. — **smooth sumac**
Belgium: Court-Saint-Etienne.
France: Barres.
Germany: Frankfurt a. Main, Grevenbroich, Lousberg Villa, Scharfenberg.
Latvia: Riga.
Netherlands: Baarn.

Rhus typhina L. — **staghorn sumac**
British Isles: Nymans.
France: Barres, Vilmorin.
Germany: Augsburg, Baden-Baden, Dyck, Eisenach, Lousberg Villa, Seebach, Sophienhof, Trier.
Latvia: Riga.
Netherlands: Baarn.

Poland: Beuthen, Sagan.
Romania: Hatarmajor.
Russia: Bryansk region.

Ribes americanum Miller — **American black currant**

Belgium.
British Isles: Nymans.
France: Barres.
Poland: Gleiwitz.

Ribes aurenum Pursh — **golden currant**

Belgium.
British Isles: Cluny, Nymans.
Denmark: Copenhagen.
France: Vilmorin.
Latvia: Riga.
Norway.
Poland: Gleiwitz.
Russia: Bryansk region.
Switzerland.

Ribes bracteosum Dougl. — **stink currant ("California black currant")**

Poland: Königsberg.

Ribes coloradense Coville — **Colorado currant**

Germany: Darmstadt Botanic Garden.

Ribes curvatum Small — **Georgia currant**

France: Barres.
Germany: Darmstadt Botanic Garden.

Ribes cynosbati L. — **pasture gooseberry**

France: Barres.

Ribes divericatum Dougl. — **straggly gooseberry**

France: Barres.

Ribes × fuscescens Jancz. — **tawny currant**

Germany: Darmstadt Botanic Garden.

Ribes glandulosum Grauer — **skunk currant**

British Isles: Nymans.

Ribes glutinosum Benth. var. **albidum** (Paxt.) Jancz. — **white nutmeg currant**

France: Barres.

Ribes inebrians Lindl. — **squaw currant**

Germany: Darmstadt Botanic Garden.

Ribes irriguum Dougl. — **Idaho gooseberry**

France: Barres.

Ribes lacustre (Pers.) Poir. — **prickly currant ("swamp currant")**

British Isles: Nymans
Germany: Scharfenberg.

Ribes leptanthum A. Gray — **trumpet gooseberry**

France: Barres.

Ribes lobbii A. Gray — **Lobb gooseberry ("gummy gooseberry")**
British Isles: Nymans.

Ribes montigenum McClatchie — **winter currant**
Germany: Darmstadt Botanic Garden.

Ribes nevadense Kellogg — **Sierra currant**
France: Barres.

Ribes odoratum Wendl. — **clove currant**
France: Barres.
Switzerland.

Ribes sanguineum Pursh — **winter currant**
Belgium.
British Isles: Nymans.
Denmark: Copenhagen.
France: Barres, Vilmorin.
Latvia: Riga.
Netherlands.
Norway.
Poland: Gleiwitz.
Switzerland.

Ribes speciosum Pursh — **fuchsia gooseberry**
British Isles: Nymans.

Ribes triste Pall. — **American red currant**
Asia: Kamchatka.

Ribes viburnifolium A. Gray — **Catalina currant**
British Isles: Nymans.
France: Barres.

Robinia hispida L. — **rose-acacia locust**
Belgium: Court-Saint-Etienne.
British Isles: Kew, London, Nymans.
France: Montpellier, Vilmorin.
Germany: Hamburg Botanic Garden.
Italy: Isola Madre (region of Lac Majeur), Sienna.

Robinia kelseyi Hutchins — **Kelsey locust**
British Isles: Nymans.
France: Barres.

Robinia neomexicana A. Gray — **New-Mexican locust**
British Isles: Colesborne, Kew.
Denmark: Gisselfeld.
France: Barres, Maulévrie, Vilmorin.
Germany: Cannstatt, Hamburg Botanic Garden, Kalkhorst, Lousberg Villa.
Latvia: Riga.
Romania: Hatarmajor.

Robinia pseudoacacia L. — **black locust**
Argentina.
Australia: Australian Capital Territory, South Australia, Victoria.

Belgium: Bloemendael, Campine, Laeken, Louvain, Raevels, Tervueren, Waremme.
British Isles: Frequently planted as ornamental in warmer parts of country. Cirencester, London, New Forest, Nymans, Tubney.
Bulgaria.
China.
Cyprus: Locations unknown; planted on roadsides and mixed with other trees in small plantations, up to 5,000 feet.
Czechoslovakia.
Denmark: Aalholm, Copenhagen, Gisselfeld, Ravnholt.
France: Barres, Colmar City Park, Fremont, Jardins des Plantes, Montpellier, Vilmorin.
Germany: Altona, Augsburg, Bavaria (state forests had 2,000), Braunfels, Cannstatt, Cologne City Forest, Eisenach, Frankfurt a. Main, Frankfurt a. Oder, Grafrath, Harbke Park, Heidelberg City Forest, Hohengehren Forstamt, Kaartz, Kalkhorst, Karlsruhe, Magdeburg, Mainau Island, Mettlach, Münster, Muskau, Pförten, Potsdam, Putbus, Riddagshausen, Rosenstein Park, Teltow, Trier, Tübingen, Weimar, Weinheim, Wendisch-Wilmersdorf, Wiesbaden, Wissen.
Hungary: Had 70,000 hectares in 1899.
India: Punjab; grows well at 4,000–6,000 feet in Himalayas.
Italy: Apennine mountains, region of the Lakes.
Japan: Asakawa.
Korea: ". . . is planted everywhere."
Latvia: Riga.
Netherlands: Het Loo.
Pakistan: Punjab, Quetta (Baluchistan).
Palestine: Locations unknown, grown in gardens, planted up to 2,000 feet.
Poland: Gleiwitz, Glogau, Königsberg, Sagan, Zielonka state forests.
Portugal: Lisbon.
Romania: Location unknown; plantation, 5,000–6,000 hectares.
Russia: Bryansk region, Caucasus, Ukraine.
Ryukyu Islands.
South Africa: Frankenwald (Transvaal); very hardy, useful for reclamation.
Spain: Madrid.
Switzerland: Constance, Zurich.
Uruguay: San Jorge.
Yugoslavia: Serbia, Szabadke (center of planting district).

Robinia viscosa Vent. **clammy locust**

British Isles: Kew, Nymans.
France: Maulévrie, Montpellier, Nantes Botanic Garden, Vilmorin.

Rosa acicularis Lindl. **prickly rose**

Asia: Kamchatka.

Rosa blanda Ait. **meadow rose**

British Isles: Nymans.
France: Vilmorin.

Rosa californica Cham. & Schlecht. **California rose**

France: Barres.

Rosa carolina L. — **Carolina rosa**
British Isles: Nymans.
France: Barres.

Rosa foliolosa Nutt. — **leafy rose**
France: Barres, Vilmorin.

Rosa gymnocarpa Nutt. — **baldhip rose**
France: Barres.

Rosa nitida Willd. — **shining rose**
British Isles: Nymans.

Rosa nutkana Presl. — **Nootka rose**
France: Barres.

Rosa pisocarpa A. Gray — **peafruit rose**
France: Barres.

Rosa setigera Michx. — **prairie rose**
France: Barres, Pézanin.
Germany: Hamburg Botanic Garden.

Rosa virginiana Mill. — **Virginia rose**
British Isles: Nymans.
France: Barres, Vilmorin.
Germany: Hamburg Botanic Garden.

Rosa woodsii Lindl. var. **fendleri** (Crép.) Rydb. — **Fendler rose**
France: Barres.

Rubus deliciosus Torr. — **boulder raspberry**
France: Vilmorin.
Germany: Hamburg Botanic Garden.

Rubus leucodermis Dougl. — **whitebark raspberry**
France: St. Mandé (Ecole d'Arboriculture).
Germany: Hamburg Botanic Garden.

Rubus odoratus L. — **fragrant thimbleberry**
France: Mt. Aigoual.
Germany: Frankfurt a. Main, Hamburg Botanic Garden.
Latvia: Riga.
Poland: Gleiwitz.
Russia: Bryansk region.

Rubus parviflorus Nutt. — **western thimbleberry**
British Isles: Nymans.
Latvia: Riga.
Romania: Hatarmajor.

Rubus spectabilis Pursh — **salmonberry**
Germany: Hamburg Botanic Garden.

Sabal palmetto (Walt.) Lodd. — **cabbage palmetto**
Portugal: Lisbon.

Salix argophylla Nutt. — **silverleaf willow**
France: Barres.

Salix candida Flügge — **sage willow**
Germany: Lousberg Villa.

Salix discolor Mühl. — **pussy willow**
Germany: Lousberg Villa.

Salix eriocephala Michx. — **Missouri River willow**
France: Barres.

Salix interior Rowlee — **sandbar willow**
France: Barres.

Salix lasiolepis Benth. — **arroyo willow**
France: Barres.

Salix lucida Mühl. — **shining willow**
Germany: Lousberg Villa.

Salix nigra Marsh — **black willow**
Germany: Lousberg Villa.
Portugal: Bussaco.

Salix planifolia Pursh. — **planeleaf willow**
Germany: Lousberg Villa.

Salix rigida Mühl. — **heartleaf willow**
Germany: Lousberg Villa.

Salix sericea Marsh. — **silky willow**
France: Barres.

Sambucus callicarpa Greene — **Pacific red elder**
France: St. Mandé (Ecole d'Arboriculture).

Sambucus canadensis L. — **American elder**
West Indies: Barbados.
British Isles: Nymans.
France: Barres.
Germany: Wendisch-Wilmersdorf.
Romania: Hatarmajor.

Sapindus marginatus Willd. — **Florida soapberry**
British Isles: Nymans.

Sarcobatus vermiculatus (Hook.) Torr. — **black greasewood**
Germany: Darmstadt Botanic Garden.

Sassafras albidum (Nutt.) Nees — **sassafras**
Belgium: Beernem, Héverlé, Tervueren, Three Kings Park.
British Isles: Rare in England. Nymans.
France: Barres, Brest Marine Gardens, Caën, Catros, Geneste City Park, Harcourt, Morlaix, Nantes Botanic Garden, Pézanin, Porzantrez, Rennes, Versailles (Petit Trianon), Vilmorin.
Germany: Bonn Botanic Garden, Cleve, Darmstadt Botanic Garden, Freiburg Botanic Garden, Giessen, Hamburg Botanic Garden, Heidelberg City Forest, Karlsruhe, Scharfenberg.

Italy: Isola Madre (region of Lac Majeur), Siena.
Japan: Asakawa.
Netherlands: Wageningen.
Portugal: Porto.
Romania: Hatarmajor.

Sequoia gigantea (Lindl.) Decne. **giant sequoia**

Algeria: Djebel Ouach.
Australia: Australian Capital Territory, New South Wales, Tasmania, Victoria (Ballarat Water Commission), Westbourne Woods.
Austria: Vienna.
Belgium: The best conditions are found in lower Belgium. Ardennes, Assenois, Belle-Etoile, Laeken, Luxembourg Park, Rhode-Sainte Genèse, St. Michel, Sept-Fontaines, Tervueren.
British Isles: Much planted in Ireland, England, and Scotland as ornamentals and in avenues; not used for plantations. Ashton, Bagley Wood, Bedgebury, Benmore, Brahan, Cluny, Colesborne, Dalforgan, Hope Toun, Long Ashton, Murthly, New Forest, Nymans, Penrhyn, Powderham, Powerscourt, Somerset County Lands, Stratfield Saye, Swansea, Tring, Tubney.
Denmark: Aalholm, Fuglsang, Häsedd.
France: Barbier nurseries, Barres, Brest Marine Gardens, Catros, Cherbourg, Colmar, Fosse, Jonchere, Maulévrie, Metz, Morlaix, Mt. Aigoual, Nantes Botanic Gorden, Nimes, Prafrance, Rennes Botanic Garden, Sénéclauze Estate, Trianon (Ecole d'Horticulture), Verrieres, Vilmorin.
Germany: Aachen, Altona, Augsburg, Baden-Baden, Badenweiler, Braunfels, Cannstatt, Cleve, Cologne, Cronberg, Darmstadt Botanic Garden, Dörenthe, Gracht, Grafrath, Haag Park, Harburg a. d. Elbe, Hohenheim, Kaartz, Kalkhorst, Karlsruhe, Lehrte, Lindau, Magdeburg, Mainau Island, Passau, Potsdam, Putbus, Reinhardtsbrunn, Riddagshausen, Sophienhof, Trier, Weinheim, Wiesbaden
Italy: Florence, Villa Troubetzkoy (regiou of Lac Majeur).
Luxembourg.
Netherlands: Arnhem, Het Loo, Schovenhorst, Wageningen.
New Zealand: Canterbury.
Poland: Danzig, Sagan.
Portugal: Bussaco.
Ryukyu Islands.
South Africa: Location unknown; under trial on small scale; doing well.
Sweden: Hardy in southwest.
Switzerland: Constance, Lucerne, Marienberg, Zurich.

Sequoia sempervirens (D. Don) Endl. **redwood**

Algeria: Djebel Ouach.
Australia: Australian Capital Territory, Queensland, South Australia, Victoria (Ballarat Water Commission), Westbourne Woods.
Belgium: Tervueren.
British Isles: Tender where not sheltered; 90-year-old grove in Montgomeryshire is the heaviest stand of timber in the island. Bagley Wood, Bedgebury, Benmore, Cluny, Colesborne, Cuffnells, Dalforgan, Dropmore, Eastnor Castle, Fulmodestone Wood, Hatfield Estate, Inverary, Leighton Hall, London, Longleat, Monk, Hopton, Montgomeryshire, Neath, New Forest, Nymans, Penrhyn, Stratfield Saye, Stourhead, Tubney.
Denmark: Charlottenlund, Copenhagen, Fuglsang.

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France: Barres, Bois de Boulogne, Bordeaux, Fosse, Fremont, Geneste City Park, Jonchere, Keranflech, Martinvast, Metz, Montpellier, Morlaix, Mt. Aigoual, Nantes Botanic Garden, Nice, Nimes, Pézanin, Prafrance, Rennes, Sénéclauze Estate, Tarbes, Verrieres, Vilmorin.
Germany: Aachen, Cologne, Cronberg, Heidelberg, Mainau Island, Weinheim.
Hawaii.
Italy: Isola Madre (region of Lac Majeur).
Japan: Asakawa.
Netherlands: Schovenhorst.
New Zealand: Canterbury, Hanmer Springs, North Island.
Palestine: Jerusalem.
Portugal: Bussaco.
Ryukyu Islands.
South Africa: Location unknown; planted experimentally; small stands doing well.
Switzerland: Zurich.

Shepherdia argentea (Pursh) Nutt. **silver buffaloberry**
British Isles: Nymans.
France: Barres, St Mandé (Ecole d'Arboriculture), Strasbourg, Villmorin.
Germany: Cronberg, Darmstadt Botanic Garden, Scharfenberg, Weinheim.
Netherlands: Wageningen.
Poland: Königsberg.

Shepherdia canadensis (L.) Nutt. **russet buffaloberry**
Austria: Vienna.
Germany: Augsburg.

Sorbus americana Marsh. **American mountain-ash**
Belgium: Cedrogne.
British Isles: Tortworth.
Denmark: Copenhagen.
France: Barres, Maulévrie.
Germany: Frankfurt a. Main.
Norway.
Poland: Königsberg.

Sorbus ×arnoldiana Rehd. **Arnold mountain-ash**
France: Barres.

Sorbus decora (Sarg.) Schneid. **showy mountain-ash**
France: Barres.

Sorbus scopulina Greene **Greenes mountain-ash**
France: Barres.
Germany: Weinheim.

Spiraea alba Du Roi **narrowleaf meadowsweet spirea**
France: Barres.

Spiraea corymbosa Raf. ———
British Isles: Cluny.
France: Barres.

Spiraea douglasii Hook. — **Douglas spirea**

Austria: Vienna.
British Isles: Cluny, Nymans.
France: Barres, Vilmorin.
Latvia: Riga.

Spiraea latifolia (Ait.) Borkh. — **broadleaf meadowsweet spirea**

France: Barres.
Poland: Gleiwitz.

Spiraea menziesii Hook. — **Menzies spirea**

France: Barres.
Poland: Gleiwitz.

Spiraea tomentosa L. — **hardhack spirea**

Austria: Vienna.
Poland: Gleiwitz.

Staphylea trifolia L. — **American bladdernut**

France: Barres.
Germany: Augsburg.
Poland: Danzig, Freienhuben, Königsberg.

Stewartia malacodendron L. — **Virginia stewartia**

British Isles: Nymans.

Stewartia ovata (Cav.) Weatherby — **mountain stewartia**

British Isles: Nymans.

Styrax americana Lam. — **American snowbell**

France: Barres.

Symphoricarpos albus (L.) Blake — **common snowberry**

British Isles: Nymans.
France: Barres, Vilmorin.
Germany: Weinheim.
Latvia: Riga.
Poland: Danzig, Freienhuben, Gleiwitz.
Russia: Bryansk region.

Symphoricarpos mollis Nutt. — **spreading snowberry**

Germany: Hamburg Botanic Garden.
Poland: Gleiwitz.

Symphoricarpos occidentalis Hook. — **western snowberry**

France: Barres, Vilmorin.

Symphoricarpos orbiculatus Moench — **Coralberry; Indian-currant**

France: Barres.
Germany: Hamburg Botanic Garden.
Poland: Gleiwitz.

Symphoricarpos oreophilus A. Gray — **mountain snowberry**

Germany: Hamburg Botanic Garden

Symphoricarpos rotundifolius A. Gray — **roundleaf snowberry**

Germany: Darmstadt Botanic Garden.

Symphoricarpos utahensis Rydb. **Utah snowberry**

France: Barres.

Taxodium distichum (L.) Rich. **baldcypress**

Australia: Melbourne, Queensland, Sydney.
Austria: Altmünster, Vienna.
Belgium: The best conditions are found in lower Belgium. Bloemendael, Brasschaet, Louvain, Lovenjoul, Rhode-Sainte Genèse, St. Michel, Sept-Fontaines, Vogelsanck Park, Waremme, Zangerey.
British Isles: Thrives in midland and southern counties of England and Ireland. Bedgebury, Broadlands, Curraghmore, Dropmore, Exeter, Edinburgh, Hatfield, Heckfield Place, Hope Toun, Kew, London, Murthly, New Forest, Nymans, Penrhyn, Reading, Salisbury, Swansea, Syon, Tring, Windsor.
Chile.
Denmark: Aalholm, Brahetrolleborg, Gisselfeld, Häsede, Knuthenborg, Ravnholt, Solestedgaard.
France: Barres, Bois de Boulogne, Bordeaux, Caën, Catros, Fontainebleau, Fremont, Geneste City Park, Harcourt, Jonchere, Limoges, Montpellier, Morlaix, Mt. Aigoual, Nantes Botanic Garden, Nimes, Prafrance, Rennes, Strasbourg, Toulon, Trianon (Ecole d'Horticulture), Versailles (Petit Trianon), Vilmorin.
Germany: Altendöbern, Altona, Augsburg, Cannstatt, Cleve, Cologne City Forest, Cronberg, Dyck, Eisenach, Erlangen, Falkenstein, Frankfurt a. Oder, Gadow, Harbke Park, Heidelberg, Hohenheim, Hohen-Niendorf, Karlsruhe, Lindau, Lousberg Villa, Magdeburg, Mainau Island, Mettlach, Münster, Muskau, Nürnberg, Pförten, Potsdam, Putbus, Riddagshausen, Scharfenberg, Schlosse Friedrichshof, Schwerin, Tübingen, Weimar, Weinheim, Wendisch-Wilmersdorf, Wiesbaden, Wörlitz.
India: Kulu.
Italy: Apennine mountains, Pisa.
Japan: Asakawa.
Netherlands: Het Loo, Landfort, Vogelzanck.
Norway: Location unknown; not hardy.
Poland: Beuthen, Danzig, Freienhuben, Glogau, Königsberg, Sagan.
Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Ukraine.
Ryukyu Islands.
South Africa: Few good trees in botanic gardens; plantation trials not promising. Cape Town.
Spain: Madrid.
Sweden: Alnarp.
Switzerland: Lucerne, Marienberg, Zurich.
Yugoslavia.

Taxodium distichum var. **nutans** (Ait.) Sweet **pondcypress**

British Isles: Kew, North Wales.

Taxodium mucronatum Ten. **Montezuma baldcypress**

Belgium: Three Kings Park.
France: Barres.

Taxus brevifolia Nutt. **Pacific yew**

France: Barres.

Taxus canadensis Marsh. **Canada yew**

British Isles: Nymans.
France: Barres.
Germany: Falkenstein, Scharfenberg, Schlenderhan.
Poland: Danzig, Freienhuben.

Thuja occidentalis L. **northern white-cedar**

Austria: Altmünster.
Belgium: Louvain, Sept-Fontaines, Tervueren.
British Isles: Auchendrane, Bedgebury, Cluny, Mumbles, Nymans, Tubney.
Cyprus: Location unknown; used only for hedges; successful.
Denmark: Aalholm, Fuglsang, Hardenberg, Knuthenborg, Solestedgaard.
Finland: Mustila, Pekola, Tammisto.
France: Barres, Martinvast, Maulévrie, Metz, Montpellier, Mt. Aigoual, Nimes, Prafrance, Vilmorin.
Germany: Altona, Augsburg, Baden-Baden, Bavaria (state forests had 11,000), Biebrich, Braunfels, Buddenhagen, Cologne, Cronberg, Dahlem, Dilborn, Eisenach, Erlangen, Falkenstein, Frankfurt a. Oder, Fürstlich Drehna, Grafrath, Grambow, Harff, Heidelberg, Hohenheim, Hohen-Niendorf, Kattmannskamp, Kromlau, Lindau, Lousberg Villa, Mettlach, Münster, Muskau, Nürnberg, Pillnitz, Ralswiek, Riddagshausen, Scharfenberg, Schleswig-Holstein, Schlosse Friedrichshof, Seebach, Sophienhof, Tharandt, Trier, Tübingen, Weimar, Weinheim, Wendisch-Wilmersdorf, Wernigerode, Wörlitz Park.
Japan: Asakawa.
Latvia: Riga.
Luxembourg.
Netherlands: Arnhem, Het Loo, Schovenhorst.
Palestine: Location unknown; satisfactory as an ornamental.
Poland: Danzig, Freienhuben, Gleiwitz, Glogau, Königsberg, Oliva.
Portugal: Cintra-Pena.
Romania: Hatarmajor.
Russia: Bryansk region, Moscow.
Sweden: Alnarp, Upsala.
Switzerland: Constance, Lucerne, Wabern.

Thuja plicata Donn **western redcedar**

Austria: Altmunster; also 9 areas (6,000 trees) planted in state and communal forests.
Belgium: Ardennes, Beernem, Belle-Etoile, Bloemendael, Capucins, Gedinne, Grand Bois, Groenhove, Louvain, Nassogne, Raevels, St. Michel, Sept-Fontaines, Tervueren, Three Kings Park, Vogelsanck Park, Waremme.
British Isles: Ardchullary, Bagley Wood, Bedgebury, Benmore, Bicton, Brahan, Cirencester, Cluny, Colesborne, Denbighshire, Dunster, Fulmodestone Wood, Inverary, Keir, Lake Vyrnwy, Leighton Hall, Leonardslee, Murthly, New Forest, Novar Estate, Nymans, Penrhyn, Pontyclun, Powerscourt, Stratfield Saye, Tubney,
Denmark: Aalholm, Brahetrolleborg, Charlottenlund, Copenhagen, Fuglsang, Häsede, Hindsgavl, Holstenhuus, Langdal, Langesoe, Ravnholt, Sölestedgaard.

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Finland: Mustila, Tammisto.

France: Barres, Catros, Champeaux, Champenoux, Dijon, Fremont, Geneste City Park, Harcourt, Keranflech, Limoges, Martinvast, Maulévrie, Metz, Montpellier, Morlaix, Mt. Aigoual, Nimes, Prafrance, Rennes Botanic Garden, Sénéclauze Estate, Trianon (Ecole d'Horticulture), Villa Thuret, Vilmorin.

Germany: Altona, Augsburg, Barnstorf, Bavaria, Cologne, Darmstadt Botanic Garden, Dilborn, Eberswalde, Erlangen, Frankfurt a. Main, Freienwalde a. Oder, Gadow, Grafrath, Hambach, Harburg a. d. Elbe, Harzburg, Heidelberg City Forest, Hohenheim, Hohen-Niendorf, Kaartz, Kalkhorst, Lindau, Lousberg Villa, Mainau Island, Münster, Muskau, Potsdam, Prussia, Riddagshausen, Röttgen, Schlemmin, Schlosse Friedrichshof, Schwerin, Seebach, Sophienhof, Tharandt, Trier, Tübingen, Weinheim, Wendisch-Wilmersdorf, Worlitz Park.

India: Kulu.

Italy: Apennine mountains, Rovelli nurseries (region of Lac Majeur).

Latvia: Riga.

Netherlands: Arnhem, Het Loo, Schovenhorst.

New Zealand: Erua State Forest (1,800 acres), Hanmer Springs.

Norway: Söfteland, south of Bergen.

Poland: Allenstein, Danzig, Freienhuben, Gleiwitz, Glogau, Königsberg.

Portugal: Bussaco, Cintra-Pena.

Romania: Hatarmajor.

Russia: Moscow, Ukraine.

South Africa.

Switzerland: Constance, Lucerne, Marienberg, Zurich.

Tilia americana L. **American basswood**

Belgium: Tervueren.

British Isles: Kew, Nymans, Tubney.

Finland: Tammisto.

France: Barbier nurseries, Barres, Champeaux, Geneste City Park, Harcourt, Morlaix, Versailles (Petit Trianon).

Germany: Augsburg, Gadow, Muskau, Pförten, Ralswiek, Teltow, Tübingen, Weinheim.

Italy: Location unknown; central part.

Latvia: Riga.

Poland: Beuthen, Glogau, Königsberg, Sagan.

Portugal: Bussaco.

Romania: Hatarmajor.

Russia: Bryansk region.

Spain.

Tilia caroliniana Mill. **Carolina basswood**

Germany: Augsburg.

Tilia heterophylla Vent. **white basswood**

Belgium: Tervueren.

British Isles: Nymans.

France: Barres, Morlaix.

Germany: Cannstatt, Ludwigslust, Mettlach, Putbus.

Netherlands: Het Loo.

Switzerland: Marienberg, Zurich.

Torreya california Torr. **California torreya**

Belgium: Sept-Fontaines.
British Isles: Hardy; uncommon in Ireland and Great Britain. Nymans.
Denmark: Charlottenlund, Copenhagen.
France: Barbier nurseries, Barres, Côtes, Fremont, Maulévrie, Metz, Rennes, Vilmorin.
Germany: Darmstadt Botanic Garden, Dörenthe, Heidelberg, Mainau Island, Tannehöft, Wörlitz.
Netherlands: Schovenhorst.
Switzerland: Lucerne, Zurich.

Torreya taxifolia Arn. **Florida torreya**

France: Brest Marine Gardens, Maulévrie, Metz.

Toxicodendron quercifolium(Michx.) Greene **poisonoak**

France: Metz, Vilmorin.
Germany: Karlsruhe, Lousberg Villa, Mainau Island, Potsdam, Seebach.

Toxicodendron radicans (L.) Kuntze **poisonivy**

France: Barres.

Toxicodendron vernix (L.) Kuntze **poison sumac**

France: Barres.

Tsuga canadensis (L.) Carr. **eastern hemlock**

Belgium: Belle-Etoile, Brasschaet, Gedinne, Gooreynd, St. Michel, Three Kings Park Tervueren, Vogelsanck Park, Zangerey.
British Isles: Almost useless for forest purposes. Benmore, Bury St. Edmunds, Carton, Cluny, Curraghmore, Dalkeith, Dunkeld, Inverary, Neath, Nymans, Penrhyn, Stratfield Saye, Tubney.
Denmark: Charlottenlund, Copenhagen, Häsede, Langesoe, Knuthenborg.
France: Barres, Catros, Fremont, Geneste City Park, Harcourt, Limoges, Mt. Aigoual, Rennes, Seneclauze Estate, Trianon (Ecole d'Horticulture), Vilmorin.
Finland: Tammisto.
Germany: Aachen, Altona, Augsburg, Baden-Baden, Barnstorf, Bavaria, Braunfels, Buddenhagen, Cleve, Coesfelder Berg, Cologne, Cronberg, Dammerutz, Dilborn, Dyck, Erfurt Forest, Erlangen, Falkenstein, Frankfurt a. Main, Gadow, Gracht, Grafrath, Harburg a. d. Elbe, Heidelberg City Forest, Hohenheim, Hohen-Niendorf, Kaartz, Kalkhorst, Karlsruhe, Kattmannskamp, Kromlau, Lindau, Lousberg, Villa, Ludwigslust, Magdeburg, Mettlach, Münster, Muskau, Nürnberg, Pförten, Pillnitz, Potsdam, Ralswiek, Reinhardtsbrunn, Riddagshausen, Schleswig-Holstein, Schlosse Friedrichshof, Schwerin, Seebach, Sophienhof, Tannenhöft, Tharandt, Trier, Weinheim, Wörlitz Park.
Italy: Region of the Lakes.
Japan: Asakawa.
Latvia: Riga.
Luxembourg.
Netherlands: Arnhem, Het Loo, Landfort, Schovenhorst, Vogelzanck.
Poland: Danzig, Frienhuben, Gleiwitz, Glogau, Königsberg, Oliva, Sagan.
Portugal: Bussaco.
Romania: Hatarmajor.
Russia: Bryansk region, Moscow.

Sweden: Alnarp.
Switzerland: Lucerne.
Yugoslavia.

Tsuga caroliniana Engelm. **Carolina hemlock**

Belgium.
British Isles: Kew, Nymans.
France: Barres, Harcourt, Pézanin.
Germany: Augsburg, Tannenhöft, Wörlitz.
Netherlands: Schovenhorst, Wageningen.

Tsuga heterophylla (Raf.) Sarg. **western hemlock**

Belgium: Belle-Etoile, Brasschaet, Capucins, Grand Bois, Turnhout.
British Isles: Grows well in many parts; being increasingly planted in British forests. Bagley Wood, Benmore, Brahan, Cardiff, Cluny, Dawyck, Dropmore, Dunach, Dunster, Durris, Fulmodestone Wood, London, Murthly, Novar Estate, Nymans, Silia, Swansea, Tubney.
Denmark: Copenhagen, Hindsgavl, Langdal, Langesoe.
France: Barres.
Germany: Darmstadt Botanic Garden, Grafrath, Harburg a. d. Elbe, Heidelberg, Hohen-Niendorf, Mainau Island, Schwerin, Tübingen, Weinheim.
Iceland.
Netherlands: Arnhem, Schovenhorst.
New Zealand: Erua State Forest, Hanmer Springs, Rotorua.
Norway: Söfteland, south of Bergen.
Poland: Glogau.
Switzerland: Lucerne.
Yugoslavia.

Tsuga mertensiana (Bong.) Carr. **mountain hemlock**

Belgium: Gedinne, Grand Bois, St. Michel, Tervueren, Vogelsanck Park.
British Isles: Ardchullary, Benmore, Cairnies, Dawyck, Eastnor Castle, Heckfield Place, Murthly, Nymans, Stratfield Saye.
Denmark: Charlottenlund, Häsede.
Finland: Mustila, Tammisto.
France: Barres, Fosse, Fremont, Harcourt, Jonchere, Limoges, Martinvast, Maulévrie, Montpellier, Mt. Aigoual, Nouan, Vilmorin.
Germany: Altona, Augsburg, Baden-Baden, Barnstorf, Coesfelder Berg, Cronberg, Dahlem, Dilborn, Dörenthe, Eberswalde, Eisenach, Falkenstein, Gadow, Grafrath, Heidelberg City Forest, Karlsruhe, Lousberg Villa, Muskau, Pförten, Pillnitz, Prussia, Scharfenberg, Schleswig-Holstein, Schlosse Friedrichshof, Schwerin, Sophienhof, Tannenhoft, Wendisch-Wilmersdorf, Wernigerode, Wörlitz Park.
Iceland.
Italy: Rovelli nurseries (region of Lac Majeur).
Netherlands: Het Loo, Schovenhorst.
Poland: Glogau, Königsberg, Oliva.
Sweden: Alnarp.
Switzerland: Zurich.

Ulmus alata Michx. **winged elm**

British Isles: Kew, Nymans.

Ulmus americana L. — **American elm**

Belgium: Lanklaer, Tervueren.
British Isles: Scattered in Ireland, England, and Scotland. Cirencester, Colesborne, Nymans, Tortworth, Tubney.
Finland: Pekola, Tammisto.
France: Barres, Champeaux.
Germany: Augsburg, Biebrich, Destedt Park, Gadow, Giessen, Harbke Park, Harzburg, Lousberg Villa, Muskau, Reinhardtsbrunn, Teltow, Weinheim, Weindisch-Wilmersdorf.
Italy.
Netherlands.
Poland: Königsberg.
Portugal: Bussaco.
Romania.
South Africa: Location unknown; promising.
Spain.

Ulmus crassifolia Nutt. — **cedar elm**

British Isles: Kew.
France: Barres.

Ulmus rubra Mühl. — **slippery elm**

Belgium: Lanklaer, Tervueren.
British Isles: Kew.
France: Barres, Champeaux, Strasbourg.
Germany: Augsburg, Erlangen, Tübingen.
Poland: Königsberg.

Ulmus serotina Sarg. — **September elm**

British Isles: Nymans.

Ulmus thomasii Sarg. — **rock elm**

British Isles: Rare, unsuitable.
Germany: Darmstadt Botanic Garden.

Umbellularia californica (Hook. & Arn.) Nutt. — **California-laurel**

British Isles: Kew, Nymans.
France: Barres, Fosse.
Germany: Heidelberg.

Ungnadia speciosa Endl. — **Mexican-buckeye**

British Isles: Nymans.

Vaccinium angustifolium Ait. — **lowbush blueberry**

British Isles: Nymans.
France: Barres.

Vaccinium arboreum Marsh. — **tree sparkleberry**

British Isles: Nymans.

Vaccinium corymbosum L. — **highbush blueberry**

France: Barres.

Vaccinium hirsutum Buckl. — **hairy whortleberry**
British Isles: Nymans.
France: Barres.

Vaccinium macrocarpon Ait. — **cranberry**
British Isles: Nymans.
France: Vilmorin.

Vaccinium ovatum Pursh — **box blueberry**
British Isles: Nymans.

Vaccinium oxycoccos L. — **small cranberry**
France: Vilmorin.

Vaccinium pallidum Ait. — **Blueridge blueberry**
France: Barres.

Vaccinium stamineum L. — **common deerberry**
British Isles: Nymans.

Viburnum acerifolium L. — **mapleleaf viburnum ("dockmackie")**
Germany: Hamburg Botanic Garden.

Viburnum alnifolium Marsh. — **hobblebush viburnum**
Austria: Vienna.

Viburnum cassinoides L. — **witherod viburnum**
Austria: Vienna.
France: Barres, Vilmorin.
Germany: Cologne Botanic Garden, Hamburg Botanic Garden, Lousberg Villa.

Viburnum dentatum L. — **arrowwood viburnum**
Germany: Cologne Botanic Garden, Lousberg Villa, Magdeburg.

Viburnum lentago L. — **nannyberry**
France: Barres.
Germany: Hamburg Botanic Garden, Lousberg Villa, Magdeburg.
Romania: Hatarmajor.
Russia: Bryansk region.

Viburnum molle Michx. — **Kentucky viburnum**
Germany: Lousberg Villa.

Viburnum nudum L. — **possumhaw viburnum**
British Isles: Nymans.
France: Barres, Vilmorin.
Germany: Muskau, Pförten.

Viburnum prunifolium L. — **blackhaw**
France: Barres.
Germany: Nürnberg.

Viburnum pubescens Pursh — **downy viburnum**
France: Barres.

Viburnum scabrellum Chapm. — ——
France: Barres.

Viburnum trilobum Marsh. — **American cranberrybush**
France: Barres.
Germany: Lousberg Villa.

Vitis acerifolia Raf. — **Longs grape**
France: Barres.

Vitis aestivalis Michx. — **summer grape**
France: Barres.

Vitis argentifolia Munson — **blueleaf grape**
France: Barres.

Vitis arizonica Engelm. — **canyon grape**
France: Barres.
Germany: Wendisch-Wilmersdorf.

Vitis baileyana Munson — **possum grape**
France: Barres.

Vitis candicans Engelm. — **mustang grape**
France: Barres.

Vitis champini Planch. — **Champin grape**
France: Barres.

Vitis doaniana Munson — **Doan grape**
France: Barres.

Vitis labrusca L. — **fox grape**
France: Barres.
Netherlands: Wageningen.

Vitis monticola Buckl. — **sweet mountain grape**
France: Barres.

Vitis palmata Vahl — **cat grape**
France: Barres.

Vitis riparia Michx. — **riverbank grape**
France: Barres.

Vitis rupestris Scheele — **sand grape**
France: Barres.

Vitis vulpina L. — **frost grape**
France: Barres.
Netherlands: Wageningen.

Washingtonia filifera (Linden) H. Wendl. — **California washingtonia**
France: Region of Nice.
Italy: Isola Madre (region of Lac Majeur).
Portugal: Bussaco.

Wistaria frutescens (L.) Poir. — **American wistaria**
British Isles: Nymans.
France: Vilmorin.

Xanthorhiza simplicissima Marsh. **yellowroot**

British Isles: Nymans.
France: Barres.
Romania: Hatarmajor.

Yucca filamentosa L. **Adams-needle yucca**

France: Vilmorin.

Yucca glauca Nutt. **small soapweed**

British Isles: Nymans.

Yucca gloriosa L. **moundlily yucca**

British Isles: Nymans.
France: Region of Nice, Vilmorin.

Yucca recurvifolia Salisb. **curveleaf yucca**

British Isles: Nymans.

Zanthoxylum americanum Mill. **common prickly-ash**

France: Pézanin, Vilmorin.
Germany: Hamburg Botanic Garden, Nürnberg.
Netherlands: Wageningen.

Zenobia pulverulenta (Bartr.) Pollard **dusty zenobia**

British Isles: Nymans.
France: Barres, Vilmorin.

LOCATIONS OF FOREIGN PLANTINGS

Specific locations of foreign plantings of North American trees are given as accurately as possible. Usually the nearest railroad station or village and the distance to the plantings are stated. Each planting is numbered, this number serving as a cross-reference in the section "The Diseases" (p. 3) to aid in locating the plantings where diseases have occurred.

Algeria

1 Djebel Ouach.

Argentina

1 Buenos Aires (Province).

Asia

1 Kamchatka.

Australia

1 Canberra (Australian Capital Territory).
2 Frazer Island.
3 Hobart (Tasmania).
4 Melbourne.
5 New South Wales.
6 Queensland.
7 Sydney.
8 Victoria (Ballarat Water Commission).
9 Westbourne Woods, near Canberra.
10 Wirrabara Forest, South Asutralia.

Austria

1 Altmünster, near Gmunden.
2 Linz.
3 Vienna.

Belgium

1 Antwerp.
2 Ardennes.
3 Arendonck.
4 Assenois, Belgian Luxembourg.
5 Beernem, west of Flanders.
6 Belle-Etoile (Soignes Forest).
7 Bloemendael, near Beernem.
8 Brasschaet, near Antwerp.
9 Calmpthout Arboretum, near Antwerp.
10 Campine, near Antwerp.
11 Capucins Forest, between Soignes and Tervueren.
12 Cedrogne, near Bruges.
13 Court-St. Etienne.
14 Gedinne, communal forest—Namur Province.
15 Gooreynd, Antwerp Campine.
16 Grand Bois, St. Jean, Haut Ardennes.
17 Groenendael Arboretum, near Brussels [groups up to 100 of each species].
18 Groenhove, near Thourout.
19 Hertogenwald, Gilleppeniver near Eupen.
20 Héverlé Forest, south of Louvain.
21 Ichteghem.
22 Laeken, near Brussels.
23 Lanklaer, Limbourg Province.
24 Longchamps Park (Waremme).
25 Louvain.
26 Louvenjoul, near Louvain.
27 Luxembourg Park, Manternach Forest.
28 Meerdael, Louvain.
29 Nassogne.
30 Raevels, between canal branching toward Turnhout and Dutch frontier.
31 Rhode-Sainte Genèse, south of Brussels.
32 St. Michel.
33 Sept-Fontaines, Rhode-St. Genèse.
34 Soignes Forest (Belle-Etoile experimental plots).
35 Tervueren.
36 Three Kings Park, near Bruges.

37 Turnhout.
38 Virton.
39 Vogelsanck Park at Zolder.
40 Waremme (Longchamps Park).
41 Wenduyne.
42 Zangerey Park, between Munsterbilsen and Eygenbilsen Campine.

Brazil

Location unknown.

British Isles

1 Aldenham, near Radlet railroad station.
2 Ardchullary, 5 miles from Callander.
3 Ardvourlie, Hebrides.
4 Ashton, near Bristol.
5 Auchendrane, near Ayr (southwest Scotland).
6 Avondale, near Rathdrum.
7 Bagley Wood, 2.5 miles from Oxford.
8 Bagshot, railroad station 18 miles from Reading.
9 Ballykilcavan, between Stradbally and Athy Moone, north of Carlow.
10 Balmoral.
11 Bath.
12 Bayfordbury, 2 miles south of Hertford.
13 Beaufort Castle (Lovat) Inverness, near Beauly.
14 Beauly.
15 Bedgebury, Goudhurst railroad station, 40 miles southeast of London.
16 Benmore, near Dunoon.
17 Bicton, 1 mile north of East Bardleight railroad station.
18 Bisham Abbey, near Marlow.
19 Brahan, 5 miles west of Conon.
20 Briton Ferry at Neath.
21 Broadlands, near Romsey.
22 Brocklesby Park, 2 miles south of Brocklesby railroad station.
23 Bury Hill, 1.5 miles southwest of Andover.
24 Bury St. Edmunds.
25 Bute House, Petersham.
26 Cairnhill (plantations), near Dunfermline.
27 Cairnies, near Perth.
28 Cardiff (Castle).
29 Carton, Maynooth.
30 Charlton Kings, near Cheltenham.
31 Chiswick Garden (Royal Horticultural Society), Horsley railroad station 22 miles south of London.
32 Cirencester.
33 Claremont Park, near Esher.
34 Cluny, 10 miles southwest of Kingussie.
35 Colesborne (Elwes), near Cheltenham.
36 Coombe Wood (Veitch nursery), 2¼ miles north of Brandon between Rugby and Coventry.
37 Corrour, Invernesshire.
38 Cuffnells, near Lyndhurst.
39 Curraghmore, near Waterford.
40 Dalforgan.
41 Dalkeith.
42 Dawyck, near Peebles (2,000 acres).
43 Denbighshire.
44 Dropmore, 2.5 miles southeast of Bourne End railroad station.
45 Dublin.
46 Dunach, near Oban.
47 Dunkeld.
48 Duns Castle, 1 mile from Duns Railroad station.
49 Dunster Estate, Alcombe near Minehead on Bristol Channel.
50 Durris, near Kincardine.
51 East Malling.
52 Eastnor Castle, 2 miles southeast of Ledbury.
53 Edinburgh.
54 Exeter.
55 Falcondale, Cardigan.
56 Fawley Court, near Henley.
57 Fota, near Cobh (Queenstown).
58 Frogmore, near Windsor Castle.
59 Fulmodestone Wood, near Kings Lynn.
60 Glasnevin (Dublin).
61 Glendye Woods, Banchory railroad station.
62 Gordon Castle, 10 miles north of Keith.
63 Grayswood, near Haslemere.
64 Hargham, 11 miles east of Thetford.
65 Hatfield Estate, near Hatfield.
66 Heckfield Place, Hampshire.

67 Highclere Castle, 2 miles southwest of Highclere.
68 Hope Toun, 6 miles east of Linlithgow.
69 Hursley Park, Winchester (Hants).
70 Invernesshire.
71 Inverary.
72 Isle of Man.
73 Keir, 1 mile northwest of Bridge of Allan; near Dunblane.
74 Kew, 20 miles west of London.
75 Killerton, 5 miles east of Exeter.
76 Kilmacurragh, definite location not known.
77 Leighton Buzzard.
78 Leonardslee, near Horsham.
79 Limerick.
80 Linton Park, near Maidstone
81 London.
82 Long Ashton, near Bristol.
83 Longleat, 2 miles east of Frome.
84 Lovat (Beaufort Castle), Inverness, near Beauly.
85 Lynedoch, near Balgowan railroad station.
86 Maiden Bradley Wood, near Frome.
87 Margam.
88 Monk Hopton, near Bridgenorth, 30 miles north of Worcester.
89 Montgomeryshire.
90 Moorburnhead Plantation, 4 miles south southeast of Newcastleton.
91 Mumbles.
92 Murthly, near Dunkeld, Peebles.
93 Neath.
94 New Forest (65,000 acres), 3 miles from Lyndhurst railroad station.
95 Northerwood, at Lyndhurst, Hampshire.
96 Novar Castle, near Novar railroad station (25 miles north of Dingwall).
97 Nymans, 2 miles from Handcross railroad station.
98 Penrhyn, near Bangor, Wales.
99 Philiphaugh, 3 miles from Selkirk.
100 Pontyclun, near Cardiff.
101 Powderham, near Exminster railroad station, 5 miles south of Exeter.
102 Powerscourt, near Bray railroad station, 15 miles from Dublin.
103 Powis Castle, near Welshpool railroad station, Wales.
104 Reading.
105 Salisbury.
106 Scone Estate, 2 miles north of Perth.
107 Silia, near Presteigne.
108 Somerset Co. Lands, Quantock Hills, 1.5 hours drive from Taunton.
109 Stanage Park, near Knighton.
110 Stanley, near Perth.
111 Stourhead, 7 miles east of Witham railroad station.
112 Stratfield Saye, 2.5 miles southeast of Mortimer railroad station.
113 Swansea.
114 Syon, near Kew.
115 Tavistock Woods, Tavistock.
116 Tortworth, 2 miles northwest of Charfield railroad station.
117 Totten House, Marlborough.
118 Tresco (Island).
119 Tring, 32 miles northwest of London.
120 Tubney, 6.5 miles from Oxford.
121 Vyrnwy, near Aberystwyth, Wales.
122 Westonbirt, 3.5 miles southwest of Tetbury.
123 Windsor Forest.

Bulgaria
Locations unknown.

Ceylon
Locations unknown.

Chile
Locations unknown—in south, 49,000 acres.

China
Locations unknown.

Cuba
Locations unknown.

Cyprus
Locations unknown.

Czechoslovakia
1 Bohemia.
2 Kysihybli Arboretum, near Banska Stiavnica.

Denmark
1 Aalholm, near Nysted.
2 Brahetrolleborg.

3 Charlottenlund.
4 Copenhagen.
5 Egelund, 5 miles south of Fredensborg.
6 Fuglsang (Lolland), halfway between Nysted and Nyköbing (Maribo County).
7 Gisselfeld, 12 miles east of Naestved.
8 Hardenberg, near Nysted.
9 Häsede, near Haslev.
10 Hindsgavl (Fyn), Odense County.
11 Holstenhuus (Fyn), southwest of Brahetrolleborg (Svendborg County).
12 Knuthenborg (Lolland), near Bandholm.
13 Langdal plantation, Hurup, inside Lim Fjord (Jutland), Hjørring County—northernmost county in country.
14 Langesoe (Fyn), southwest of Ulstrup; halfway between Stillebaek and Trostrup (Odense County).
15 Ravnholt (Fyn).
16 Sölestedgaard Estate (Lolland); 10 miles east of Nakskov (Maribo County).

Estonia

1 Tartu.

Finland

1 Helsinki (Helsingfors) Botanical Garden.
2 Mustila Arboretum, 35 kilometers from Koria.
3 Pekola, unable to locate.
4 Tammisto, southwest Finland on large inland lake.

France

1 Amance.
2 Angers.
3 Antibes, Villa Thuret (state arboretum).
4 Baleine.
5 Barbier nurseries, LaFerté St. Aubin railroad station.
6 Barres, Nogent-sur-Vernisson railroad station; National Arboretum with numerous forest plantations; best in France and perhaps Europe.
7 Béarn, Basses-Pyrénees.
8 Beuvronne, LaFerté St. Aubin railroad station.
9 Bois de Boulogne, near Paris.
10 Bonsecours [Nat. Ecole des Eaux et Forêts].
11 Bordeaux.
12 Brest (Marine Gardens).
13 Bretagne.
14 Caën.
15 Catros, 10 kilometers from Bordeaux, begun late 1700's; seed from America.
16 Champeaux, 4 kilometers from Gacé.
17 Champenoux, near Nancy.
18 Cherbourg.
19 Colmar.
20 Colombez.
21 Côtes commune, Loges-en-Josas; park near Jouy-en-Josas, 10 miles southeast of Paris.
22 Dijon.
23 Ecole d'Horticulture, Trianon, Versailles.
24 Fontainebleau.
25 Fosse, Montoir-sur-le-Loir.
26 Fremont, 12 kilometers from Cherbourg.
27 Geneste City Park, 15 kilometers from Bordeaux. In 1860 said to be one of the three most important forests of exotics in France.
28 Grêve, near Tonnay-Charente. Calcareous soil.
29 Grignon, Nat. Ecole d'Agricole.
30 Harcourt, Serquigny railroad station. One of best arboreta in France. Begun 1851 by Pepin.
31 Jardins des Plantes, Paris.
32 Jonchere.
33 Keranflech.
34 Limoges.
35 Lusse.
36 Martinvast, near Cherbourg.
37 Maulévrie Arboretum, Angers. 2,000 spp. One of best in France.
38 Metz.
39 Mont Aigoual, 50 kilometers from Nimes. Mountain with "Atlantic" and "Mediterranean" climatic slopes. Under National Ecole des Eaux et Forêts direction. There are 5 arboreta at

different elevations and aspects: L'Hort de Dieu, 1,300 m.; Lafour, 900 m.; Fuechagut, 1,000 m.; St. Sauveur, 800–900 m.; Trevezel.

40 Montpellier, Ecole d'Agricole.
41 Morlaix.
42 Mortola, between Menton and Ventimille.
43 Mouillefert.
44 Nantes.
45 Nice (Chambrun Park).
46 Nimes.
47 Nouan, 5 kilometers from Gien.
48 Pézanin, Dompierre-les-Ormes.
49 Porzantrez, near Morlaix.
50 Prafrance, Anduze.
51 Quimper.
52 Rennes.
53 St. Mandé, Ecole d'Arboriculture, near Paris.
54 Schlumberger, near Colmar (toward Vosges Mountains).
55 Segrez (Allard).
56 Sénéclauze, near Bourg-Argental.
57 Strasbourg Botanic Garden.
58 Tarbes.
59 Toulon.
60 Toulouse.
61 Trianon, Ecole d'Horticulture.
62 Verrieres.
63 Versailles (Petit Trianon).
64 Villa Hanbury (Nice).
65 Villa Thuret, 12 miles from Nice.
66 Vilmorin, Verrieres-le-Buisson railroad station.

Germany

1 Aachen.
2 Altendöbern, near Kottbus.
3 Altona.
4 Augsburg.
5 Baden-Baden.
6 Badenweiler.
7 Bamberg.
8 Barnstorf, about 50 kilometers south of Bremen.
9 Bavaria (State).
10 Berlin.
11 Biebrich, near Wiesbaden.
12 Bishofswalde.
13 Bonn.
14 Braunfels.
15 Buddenhagen.
16 Canstatt, 3 miles east of Stuttgart.
17 Cleve.
18 Coesfelder Berg, near Coesfeld.
19 Cologne.
20 Constance (Lake).
21 Cronberg a. Taunus Mountains.
22 Dahlem, near Berlin.
23 Dammerutz.
24 Darmstädt.
25 Destedt.
26 Dilborn, near Brugen 36 kilometers from Cleve.
27 Dörenthe, near Ibbenbüren.
28 Dyck.
29 Eberswalde.
30 Eisenach.
31 Elberbarg (Hessen-Nassau Province).
32 Erfurt Forest.
33 Erlangen.
34 Falkenstein, near Frankfort a. Main.
35 Frankfort a. Main.
36 Frankfort a. Oder.
37 Freiburg.
38 Freienwalde, 38 miles northwest of Berlin.
39 Freising.
40 Fürstlich Drehna, near Kottbus.
41 Gadow Forest (2,500 hectares) between Wittenburg and Lenz.
42 Giessen.
43 Gracht, near Cologne.
44 Grafrath, 20 miles from Munich.
45 Grambau.
46 Grevenbroich.
47 Haag Park, near Cleve.
48 Hambach.
49 Hamburg.
50 Harbke Park, 4 kilometers from Helmstedt.
51 Harburg, 12 kilometers from Altona.
52 Harff.
53 Harzburg, near Wernigerode.
54 Heidelberg City Forest.
55 Hessen-Nassau Province.
56 Hohengehren Forstamt, vicinity of Stuttgart.
57 Hohenheim, near Stuttgart.
58 Hohen-Niendorf, near Rostock.
59 Ilten, near Lehrte.
60 Kaartz, near Brüel, 30 kilometers from Schwerin (Mecklenburg).

61 Kalkhorst.
62 Karlsruhe.
63 Kattmannskamp, near Münster.
64 Kromlau, near Kottbus.
65 Lehrte.
66 Lindau.
67 Lörsfeld (Klettenburg Park), near Cologne.
68 Lousberg Villa, near Aachen.
69 Ludwigslust, about 30 kilometers south of Schwerin.
70 Magdeburg.
71 Mainau Island, near Lindau.
72 Marienhof.
73 Mettlach.
74 Moselle.
75 Münster.
76 Muskau, 40 kilometers south southeast of Kottbus.
77 Nürnberg.
78 Ödelsheim Oberforst (Hessen-Nassau Province).
79 Passau.
80 Pförten, near Kottbus (80,000 morgen).
81 Pillnitz.
82 Potsdam.
83 Prussia (State).
84 Putbus, on Rugen Island.
85 Ralswick.
86 Reinhardtsbrunn, Fröttstedt railroad station.
87 Riddagshausen, near Braunschweig.
88 Römerpark (Cologne).
89 Rosenstein Park, near Stuttgart.
90 Röttgen, near Cologne.
91 Scharfenberg, near Berlin.
92 Schlemmin, W. Mecklenburg.
93 Schlenderhan.
94 Schleswig-Holstein (State).
95 Schloss Dyck.
96 Schlosse Friedrichshof, near Cronberg.
97 Schwarzwald.
98 Schwerin (Mecklenberg).
99 Seebach, near Gotha.
100 Sophienhof (Vorpommern).
101 Spessart.
102 Tannenhöft, near Altona.
103 Teltow, 10 miles south of Berlin.
104 Tharandt, near Dresden.
105 Trier.
106 Tübingen.
107 Villa Selve (Cologne).
108 Weimar.
109 Weinheim.
110 Wendisch-Wilmersdorf, Berlin suburb.
111 Wernigerode.
112 Wiesbaden.
113 Wilhelma.
114 Wissen, 20 kilometers from Cleve.
115 Wörlitz Park, near Dessau.

Hawaii

Location unknown.

Hungary

1 Godollo, near Budapest.

Iceland

Location unknown.

India

1 Kulu.
2 Punjab.
3 Raniket.

Italy

1 Apennine mountains.
2 Florence.
3 Genoa Botanical Garden.
4 Isola Bella, Lac Majeur.
5 Isola Madre, Lac Majeur.
6 Naples Botanical Garden.
7 Padua.
8 Palermo.
9 Pisa.
10 Rovelli Brothers (nurseries)—one of the richest collections in Italy; mostly young plants, but some very old trees also.
11 Siena (Province).
12 Villa Barbo, Lac Majeur.
13 Villa Troubetzkoy, Lac Majeur.

Japan

1 Asakawa Arboretum.
2 Tokyo University Forest.

Kenya

Locations unknown.

Latvia

1 Riga.

Lithuania

Locations unknown.

Luxembourg

Locations unknown.

Madeira Islands

1 Camacha.

Netherlands
1 Arnhem.
2 Baarn.
3 Het Loo, near Apeldoorn.
4 Landfort, near Cleve, Germany.
5 Schovenhorst, 2 kilometers from Putten.
6 Vogelzanck, ¾ hour by rail from Hasselt.
7 Wageningen.

New Zealand
1 Canterbury.
2 Christchurch.
3 Erua State Forest (Central North Island).
4 Hanmer Springs.
5 Rotorua.
6 Waipona.
7 Wellington.

Nigeria
Locations unknown.

North Rhodesia
Location unknown.

Norway
1 Christiana.
2 Salmon Arm.
3 Tröndelag County.
4 Westland.

Nyasaland
Location unknown.

Pakistan
1 Punjab.
2 Quetta (Baluchistan).
3 Sind.

Palestine
1 Acre.
2 Jerusalem.

Poland
1 Allenstein.
2 Beuthen.
3 Danzig.
4 Freienhuben, near Danzig.
5 Gleiwitz.
6 Glogau.
7 Gosda.
8 Gumbinnen.
9 Klanin.
10 Königsberg.
11 Oliva, near Danzig.
12 Prussian (State) East.
13 Sagan.
14 Zielonka State Forests (Ponzań Province).

Portugal
1 Bussaco.
2 Choupat Forest, near Coimbre.
3 Cintra-Pena, near Lisbon.
4 Coimbre.
5 Lisbon.
6 Montserrate, near Cintra.
7 Porto.

Romania
1 Hatarmajor, southeast of Temesvar.
2 Neagratal, hear Brosteni.

Russia
1 Baltic Provinces.
2 Bryansk region.
3 Caucasus.
4 Mokhovsk District.
5 Moscow.
6 Soukhoum.
7 Leningrad [St. Petersburg].
8 Tambov-Ryazan region.
9 Turkmenistan.
10 Ukraine.
11 Uzbekistan.

Ryukyu Islands
Locations unknown.

South Africa
1 Cape Colony.
2 Cape Town.
3 Frankenwald (Transvaal).
4 Knysna (Midland Conservancy).
5 North Transvaal.
6 Zululand.

South Rhodesia
Locations unknown.

Spain
1 Guipúzcoa.
2 Madrid.

Sweden
1 Alnarp, near Malmoe.
2 Jönköping.
3 Lund.
4 Stockholm.
5 Upsala.

Switzerland

1 Baden.
2 Bienne (Vaud Canton), 17 miles north-northwest of Bern, near Lake of Biel.
3 Bremgartenwald, near Bern.
4 Constance.
5 Engadine.
6 Fribourg.
7 Langenthal.
8 Lausanne.
9 Lenzbourg.
10 Lucerne.
11 Marienberg on Lake Constance.
12 Morat.
13 Neuchatel Canton.
14 Pontresina.
15 Rütiwald, near Rüti.
16 St. Moritz.
17 Vaud Canton.
18 Wabern, near Bern.
19 Witen, near Rorschach.
20 Zofingen.
21 Zurich.

Uganda

Location unknown other than "near *the* Lake" (Lake Victoria?).

Uruguay

1 San Jorge (160 miles north of Montevideo).

West Indies

1 Barbados.

Yugoslavia

1 Croatia.
2 Serbia.
3 Szabadke (Subotica), 100 miles south of Budapest.

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