HEDGES AND THEIR USES

WITH

NOTES ON TREES AND SHRUBS TESTED FOR HEDGE PURPOSES AT THE CENTRAL EXPERIMENTAL FARM, OTTAWA; AND LISTS OF BEST HEDGES AT THE BRANCH EXPERIMENTAL STATIONS

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General view of hedges, east to west, Central Experimental Farm, Ottawa, Ont.

HEDGES AND THEIR USES

The collection of hedges at the Central Experimental Farm, Ottawa, is the largest with which the writer is familiar. Since the planting of sample hedges was begun in 1889 no less than 136 species and varieties of trees and shrubs have been tested for hedge purposes and in 1929 there were still 84 hedges growing at the Central Farm for comparison. In addition, there are several miles of hedges, mainly of American Arbor-vitae, to form enclosures and for borders along roads.

Hedges have been made a special feature on nearly all of the Dominion Experimental Stations, although at some of the newer ones the number planted has been limited mainly to those found most satisfactory at the older Stations where the climate was somewhat similar.

The usual length of the sample hedge is 50 feet and the plants are set 18 inches apart in a single row. These many sample hedges at twenty Experimental Stations in Canada, from Prince Edward Island to Vancouver Island, have proved very useful in giving inspiration to plant hedges, and guidance as to what to plant, to the many visitors visiting these Stations.

Acknowledgments

The photographs of hedges at the Central Experimental Farm have been taken and supplied through the courtesy of Dr. Frank T. Shutt. Those from the Branch Stations have been furnished by the Superintendents, to whom the author is also indebted for lists of best hedges.

WHY HEDGES SHOULD BE PLANTED

The visitor to Great Britain is impressed by the general use of hedges in that country. He is also impressed by the attractiveness of the landscape and undoubtedly the pleasure experienced in viewing this landscape is induced by the fact that hedge-bounded fields and gardens give the impression of comfort, contentment, home-likeness, neatness, snugness and completeness which is very satisfying to the man or woman who has experienced the joy of an attractive home, and if he has not one, which sets up a longing for it.

If one has attractive home grounds but has, alongside of them, a vacant, weed-grown, conspicuous lot, or if one has a neighbour who has a very unattractive or unsightly lawn or garden, one cannot get the full enjoyment of the result of one's own efforts. There is a constant jar on the artistic sense if one is at all sensitive. Here is where a hedge is useful. One can soon not have to look beyond one's own property. Or, as it often happens, if our own backyard is very untidy or unsightly, or if there are unsightly buildings in the rear of the house, which can be seen from the front, we have another use for a hedge in screening the back from the front. It may be also that, looking from the front of the house, we look across a public road with something unsightly in our line of vision. A hedge near the road may hide that. Sometimes by having a hedge near a road or at the end of a lawn, at a certain height, we can shut out all unsightly objects which are nearby and look across to fields or to other pleasant sights in the distance. In the country, when only a small lawn can be kept in good condition, it is desirable to separate it from the field or adjoining areas by a hedge or hedges. One must avoid, however, giving a box-like effect to a very small lawn by a hedge across the front of it or around all sides of it.

Hedges may be planted as boundaries to a lawn, even though our neighbour's property is attractive, for they make desirable backgrounds to flower borders and they may serve a double purpose by stopping the passage of children and animals.

On small places a general purpose hedge is usually desirable, but for larger properties hedges may be planted for special features, such as for their attractive or conspicuous foliage or bark. They may be kept untrimmed, as flowering hedges, or tall hedges may be desired to break the force of the wind and evergreens, especially, will give a greater feeling of snugness in winter. Hedges may be planted to make live fences to prevent the passage of animals and to make the fields and gardens more attractive. Hedges should help to give the house a pleasing setting and this should be kept in mind when deciding where to plant one. Hedges are desirable to prevent the drifting of snow, but should be not less than thirty-five feet away from the road it is desired to protect, as, if closer, the snow may bank up so much that the bank will extend to the road, when it would be better if the hedge had not been there.

What one should avoid in planting hedges is to cut up the lawn unnecessarily. The more open lawn there is the better the effect, as a rule. If there are pleasant vistas from the house, try and avoid cutting them off by a hedge, unless it seems more important to have the hedge for some special purpose. It is best to not have a hedge between the house and the highway if the lawn is small though, for purposes of privacy, this is sometimes desirable. A hedge should seem to lead from one place or object to another and sometimes it is desirable to provide something, such as a clump of shrubs, near which the hedge terminates.

Hedges should have abundance of light on all sides to develop satisfactorily. At Ottawa the sample hedges were planted ten feet apart at first but it was found that this was too close as sunlight was cut off the base of the hedge too early in the day and the foliage became weak and branches died of some of the hedges. Fifteen feet apart has been found a more satisfactory distance. Some hedges will, of course, stand more shade than others.

PLANTING AND CARE OF HEDGES

Soil.—When it has been decided where a hedge is to go the soil should be well prepared. If the soil is a very light or poor one it will be worth while removing it to a width of three feet and to a depth of two feet or more and replacing it with good loamy soil, as it is important to provide an abundance of plant food for best results, although it is surprising how some hedge plants will succeed in rather poor soil and, if it is not possible to remove as much of the poor soil as has been suggested, the hedge may develop very well without it. If the soil is a very stiff clay it is desirable to either remove it altogether, as has been suggested, or mix it thoroughly with sandy loam. Good drainage is essential as, if the hedge is planted where the water will lie in the autumn or winter, the plants are liable to heave and, in some cases, roots may be killed in winter.

Plants and Planting.—Plants from one to three feet in height are best in most cases, as the smaller the plants the easier it will be to have them well clothed with branches to the ground. A single row of plants is usually quite sufficient to make a good hedge. The plants should be set from fifteen to eighteen inches apart. While some trees might make more permanent hedges if planted at a greater distance than this, it is interesting to note that plants of some of the best tree hedges at the Central Experimental Farm, Ottawa, were

Japanese barberry (*Berberis Thunbergii*), planted 1914. Common lilac alongside, planted 1890, Central Experimental Farm, Ottawa, Ont., 1930.

Wayfaring tree (*Viburnum Lantana*), planted 1890, Central Experimental Farm, Ottawa, Ont., 1930.

planted eighteen inches apart forty years ago and are still in almost perfect condition, two which might be mentioned being Canada Hemlock and White Pine. If one desires to save expense plants may be set two feet or more apart with good results, but it takes a little longer to form a hedge at this distance and there is this disadvantage that if a plant happens to die it leaves a very wide gap which will take some time to fill up satisfactorily again.

Hedges such as the Siberian Pea Tree or Japanese Barberry can be started readily from seed sown thinly in the spring where the hedge is to be. After the first year's growth the plants should be thinned to fifteen to eighteen inches apart and the surplus used elsewhere if desired. Others, such as dogwood, willow, privet, bush honeysuckle and spiraea, can be started from cuttings. In planting it is desirable to set the plants a little deeper, say an inch or so, than they were before, so that if there should be a little heaving the first year they will not be so likely to be too shallow afterwards. Early spring planting is usually the most satisfactory, though the hedges may be planted successfully in the autumn. Firm the soil well when planting so that the roots will come in close contact with it and begin to draw moisture and food as soon as possible.

It often happens that quite large plants are used for hedges and merely pruned sufficiently to make them the same height. When this occurs the hedge is very likely to never thicken satisfactorily within two or three feet of the ground and does not look well. Plants do not usually send out many branches below the point where they are cut off. When large plants are used one should ruthlessly cut them back, immediately after planting, to within five to six inches of the ground, then they will leaf out from near the ground and will always remain so if they are kept well pruned and have plenty of light. When the plants used are smaller they also should be cut back in the same way, except in the case of evergreens well branched to the ground, which usually thicken well without this severe heading back.

As the American Arbor-vitae is often dug from the wild and the plants used for hedge making, and as some of these plants are very open at the base, or without branches, it is desirable to plant these latter plants deeper than the others so as to bring the leafy branches close to the ground, as, if the top is cut off altogether and only branchless stems left, they may not leaf out at all. The arbor-vitae will stand this deep planting as they will root out along the stem.

Trimming.—Little experimental work seems to have been done in regard to the best time to trim hedges, but from the experience at Ottawa it would not seem to make very much difference, as far as the health of the plant is concerned, at what time the hedge is trimmed, except that if trimmed when frost is in the branches there may be many twigs unnecessarily broken off or, in the case of evergreens, many leaves.

If hedges are pruned in early spring before growth starts, should the growth that is made during the summer be uneven, as often happens, the hedge has a ragged or untidy look and, if pruned in the autumn, the same thing, of course, is liable to occur when growth takes place the next spring. Neither of these seasons for trimming seems to the writer as satisfactory as that adopted for trimming the sample hedges at the Central Experimental Farm, which have been trimmed at approximately the same time for forty years. This is towards the end of June, for most species, when the season's growth is almost completed. When clipped at this time a very short growth usually takes place on some hedges which is just enough to cover the wounds which have been made in trimming. The growth of conifers is, in most cases, a little later than deciduous plants, hence trimming of evergreen hedges should be delayed until

American Arbor-vitae (*Thuja occidentalis*), planted 1890. Goldenleaf Ninebark (*Physocarpus opulifolius aureus*) alongside, planted 1890, Central Experimental Farm, Ottawa, Ont., 1930.

American Arbor-vitae (*Thuja occidentalis*) around garden, planted 1889, Central Experimental Farm, Ottawa, Ont., 1930.

about the middle of July. Trimmed at this time of year the hedges have a neat appearance for between ten and eleven months of the year. A few hedges sometimes require going over a second time to remove a few irregular second growths which are made. The trimming of hedges should be done annually and if they cannot be trimmed at one season it is better to trim at another than to neglect it.

Shape.—What shall the shape of the hedge be? This is to some extent a matter of taste. Some like to have the hedge much in the shape of an equilateral triangle, coming to a narrow ridge at the top. Others like it to rise to a certain height in rectangular form and then narrow sharply to the top, while in other cases it is given a rectangular, broad, flat finish at the top. Others prefer to have the top slightly rounded and others with a broad, rounded top.

At Ottawa most of the hedges are broadest at the base, gradually narrowing to the top, which is slightly rounded. It is thought that this shape has the most pleasing outline to most people. A broad top is liable to hold too much snow and thus spread the hedge. We cannot too strongly emphasize the importance of having the broadest part of the hedge at the base, no matter what form it may take farther up. The mistake was made at Ottawa of letting some hedges become broadest half way up, with the result that the bottom became weak.

Width of Hedge.—One must look ahead a good many years in trimming hedges. If too much growth is left on each year the hedge will take up much too much space in a few years. If, for instance, one inch of growth is left on all over the hedge each year that means an increase of two inches in width each year. In twenty-five years the hedge would be over four feet wide at the base. If two inches were left each year it would gain four inches in width each year, reaching a width at the base of over eight feet in twenty-five years. One should not be too eager to get a large hedge quickly. The hedge will be thicker and it will be easier controlled if it is cut back almost to old wood each year. Deciduous hedges may be cut back severely if they have become too big and they will come back again, but in the case of evergreens it does not do to trim them severely at any time as, if bare branches are exposed, they will not become covered with foliage again as do deciduous plants, but the branches will die and the hedge become unsightly. Sometimes it is necessary to cut back an old evergreen hedge several feet. When this is done it leaves a broad, bare top unless provision is made to cover it from the sides. This can be done by leaving the hedge the usual height at the outside of the top and then bending these outside branches over the bare top and tying them down. After a year or two they will remain in place and the top of the hedge will be green.

Cultivation and Fertilizers.—Hedges will thrive best if the soil is kept cultivated and free of weeds to a width of two feet or more on each side of it and an occasional top dressing of well-rotted barnyard manure, or some complete fertilizer, will no doubt prove of benefit, especially if the soil is light, but it should be kept off the foliage.

Deciduous Trees and Shrubs Tested for Hedges at the Central Experimental Farm, Ottawa

Name	Date of planting	Height 1929–1930		Width at base 1929–30		Notes
		ft.	in.	ft.	in.	
Acer campestre—Hedge maple	1895	4	2	8	–	Removed 1930
Acer ginnala—Amur maple	1894	–	–	–	–	" 1911
Acer glabrum—Rocky Mountain maple	1895	4	8	4	9	" 1930
Acer monspessulanum—Montpelier maple	1895	–	–	–	–	"
Acer Negundo—Box elder	1891	–	–	–	–	" 1919
Acer pennsylvanicum—Striped maple	1897	–	–	–	–	" 1911
Acer spicatum—Mountain maple	1897	–	–	–	–	" 1911
Alnus glutinosa imperialis—Royal alder	1897	–	–	–	–	" 1930
Alnus viridis—Green alder	1896	–	–	–	–	"
Artemisia Abrotanum—Southernwood	1896	2	–	1	3	
Artemisia Abrotanum tobolskianum	1896	–	–	–	–	" 1913
Berberis Thunbergii—Japanese barberry	1890&1914	3	8	4	7	
Berberis Thunbergii atropurpurea—Purple Japanese barberry	1926	1	10	1	3	
Berberis Thunbergii minor—Box barberry	1924	1	6	1	4	
Berberis vulgaris—European barberry	1889	–	–	–	–	" 1911
Berberis vulgaris atropurpurea—Purple barberry	1889	5	–	6	–	
Betula alba pubescens—European white birch	1897	6	2	8	–	
Betula lutea—Yellow birch	1895	5	9	7	–	
Betula nigra—River birch	1897	5	9	8	2	
Betula papyrifera—Canoe birch	1895	6	7	7	5	
Betula populifolia—Gray birch	1897	6	7	9	–	
Calycanthus floridus—Common sweetshrub	1895	–	–	–	–	" 1917
Caragana arborescens—Siberian pea tree	1889&1911	5	2	4	7	
Caragana frutex—Russian pea shrub	1896	6	6	7	–	
Caragana pygmaea—Dwarf pea shrub	1895	3	5	4	9	Removed 1929 replanted 1929
Carpinus betulus—European hornbeam	1897	3	4	7	4	Removed 1929
Celtis occidentalis—Nettle tree	1891	–	–	–	–	"
Cornus alba sibirica—Coral dogwood	1896	–	–	–	–	"
Cornus alba sibirica variegata—Variegated coral dogwood	1896	–	–	–	–	"
Cornus Amomum—Silky dogwood	1897	4	10	5	–	
Cornus Baileyi—Bailey dogwood	1897	7	6	9	–	
Cornus stolonifera flaviramea—Goldentwig dogwood	1924	4	2	4	2	
Cotoneaster acutifolia—Peking cotoneaster	1896	–	–	–	–	Removed
Cotoneaster integerrima—European cotoneaster	1896	4	11	7	–	
Cotoneaster microphylla	1895	–	–	–	–	Winter-killed
Cotoneaster rotundifolia buxifolia—Box cotoneaster	1895	–	–	–	–	"
Cotoneaster Simonsii—Simons cotoneaster	1895	–	–	–	–	"
Crataegus crus-galli—Cockspur thorn	1913	–	–	–	–	
Crataegus tomentosa	1890	9	3	6	2	
Cydonia Maulei—Lesser flowering quince	1894	–	–	–	–	Removed 1911
Cytisus elongatus	1894	–	–	–	–	Removed
Cytisus supinus (capitatus)—Bigflower broom	1894	–	–	–	–	"
Deutzia scabra crenata	1894	–	–	–	–	"
Eleagnus angustifolia—Russian olive	1917	2	8	2	3	" 1929
Euonymus americanus—Brook euonymus	1897	–	–	–	–	" 1911
Fagus americana—American beech	1897	5	10	7	4	
Fagus sylvatica—European beech	1895	–	–	–	–	Winter-injured, removed 1913
Gleditsia triacanthos—Honey locust	1889	9	3	7	7	
Hamamelis virginiana—Common witch hazel	1913	3	7	3	9	
Hippophae rhamnoides—Common sea-buckthorn	1895	–	–	–	–	Removed 1915
Hydrangea paniculata grandiflora—Peegee hydrangea	1915	3	3	2	3	
Larix europaea—European larch	1897	3	8	4	7	
Larix laricina—American larch	1895	4	6	5	6	
Ligustrum ibota Regelianum—Regal privet	1926	1	10	1	6	
Ligustrum vulgare—European privet	1924	3	7	2	10	
Lonicera tatarica—Tartarian honeysuckle	1896	6	–	7	–	
Lonicera tatarica elegans	1896	5	9	7	9	Removed
Malus baccata aurantiaca—Siberian crab	1897	–	–	–	–	Removed 1911
Malus Niedzwetzkyana x *P. baccata*	1926	1	10	1	–	
Morus alba tatarica—Russian mulberry	1889	9	3	10	3	
Philadelphus coronarius aureus—Golden mockorange	1894	–	–	–	–	Removed 1911
Philadelphus coronarius nanus—Dwarf mockorange	1898	–	–	–	–	" 1911
Philadelphus coronarius primulaeflorus—Double flowered mockorange	1894	–	–	–	–	Removed
Philadelphus grandiflorus—Big scentless mockorange	1897	7	10	7	6	Removed 1929

Deciduous Trees and Shrubs Tested for Hedges at the Central Experimental Farm, Ottawa —*Concluded*

Name	Date of planting	Height 1929–1930		Width at base 1929–30		Notes
		ft.	in.	ft.	in.	
Philadelphus Lewisii (cordifolius)—Lewis mock-orange	1897	4	9	4	3	" 1929
Physocarpus opulifolius—Ninebark	1895	–	–	–	–	Removed
Physocarpus opulifolius aureus—Goldleaf ninebark	1890	7	6	11	3	
Populus nigra italica—Lombardy poplar	1895	–	–	–	–	Removed 1929
Prunus americana—American plum	1894	–	–	–	–	" 1915
Prunus Grayana—Japanese bird cherry	19 0	–	–	–	–	" 1919
Prunus Mahaleb—Mahaleb cherry	1897	–	–	–	–	Winter-injured, removed.
Prunus pennsylvanica—Pin cherry	1898	–	–	–	–	Removed 1913
Prunus serotina—Black cherry	1897	6	5	6	4	
Ptelea trifoliata—Common hoptree	1893	3	5	2	4	Removed 1930
Pyrus communis—Common pear	1897	5	6	5	9	" 1930
Quercus imbricaria—Shingle oak	19 3	5	7	5	6	
Quercus palustris—Pin oak	1895	–	–	–	–	Winter-injured, removed
Quercus robur—English oak	1895	6	–	8	10	Removed 1930
Rhamnus cathartica—Common buckthorn	1895	6	6	6	4	
Rhamnus Frangula—Alder buckthorn	890 & 189	6	6	8	4	
Ribes alpinum—Mountain currant	1916	1	9	1	10	
Ribes odoratum—Golden currant	1898	–	–	–	–	Removed 1915
Rosa rubiginosa—Sweet briar	1890	–	–	–	–	Removed
Rosa rubrifolia—Redleaf rose	1890	–	–	–	–	"
Rosa rugosa—Japanese rose	1890	–	–	–	–	Removed 1911
Salix acutifolia—Sharpleaf willow	1895	–	–	–	–	" 1915
Salix incana (S. rosmarinifolia)—Rosemary willow	1898	–	–	–	–	" 1915
Salix pentandra—Laurel willow	19.3	–	–	–	–	Removed
Salix vitellina (S. voronesh)—Golden willow	1898	–	–	–	–	"
Shepherdia canadensis—Russet Buffalo berry	1897	–	–	–	–	"
Sorbus americana—American mountain ash	1898	–	–	–	–	"
Sorbus Aucuparia—European mountain ash	1898	6	5	4	2	" 1930
Spiraea arguta—Garland spirea	1898	4	4	4	7	Removed 1929
Spiraea chamaedryfolia—Germander spirea	1896	–	–	–	–	" 1913
Spiraea Douglasii—Douglas spirea	1894	–	–	–	–	" 1913
Spiraea nipponica rotundifolia—Big Nippon spirea	1894	–	–	–	–	Winter-injured, removed.
Spiraea Vanhouttei—Vanhoutte spirea	1891	–	–	–	–	Removed
Symphoricarpus racemosus—Common snowberry	1890	–	–	–	–	"
Syringa chinensis—Rouen or Chinese lilac	1890	–	–	–	–	"
Syringa japonica—Japanese tree lilac	1911	4	9	4	6	
Syringa Josikaea—Hungarian lilac	1891	9	–	11	6	
Syringa villosa—Chinese lilac	1911	5	4	6	1	
Syringa vulgaris—Common lilac	1890	11	2	14	7	
Ulmus americana—American elm	1889	–	–	–	–	Removed 1911
Viburnum Lantana—Wayfaring tree	1890	7	–	10	4	
Viburnum Opulus—European cranberry bush	1894	–	–	–	–	Removed 1911
Weigela Sieboldii variegata—Silveredge Weigela	1896	–	–	–	–	Winter-injured, removed 1913.
Zanthoxylum americanum—Common prickly ash	1889	7	6	6	5	

Evergreen Trees and Shrubs Tested for Hedges at Central Experimental Farm, Ottawa

Name	Date of planting	Height 1929–1930		Width at base 1929–30		Notes
		ft.	in.	ft.	in.	
Abies balsamea—Balsam fir	1897	3	9	5	2	
Juniperus communis hibernica—Irish juniper	1891	–	–	–	–	Removed 1911
Juniperus communis suecica—Swedish juniper	1897	5	4	9	–	
Juniperus Sabina—Savin	1897	–	–	–	–	Removed
Juniperus virginiana—Red cedar	1913	4	–	4	1	
Picea canadensis—White spruce	1889	4	6	4	8	
Picea excelsa—Norway spruce	1889	–	–	–	–	Removed 1911
Picea pungens Kosteriana—Koster blue spruce	1914	4	5	3	9	
Pinus Banksiana—Jack pine	1909	–	–	–	–	Removed
Pinus Cembra—Swiss stone pine	1894	4	6	4	10	
Pinus mugo mughus—Mugho pine	1916	3	10	3	10	
Pinus ponderosa—Western yellow pine	1895	–	–	–	–	Removed 1929
Pinus resinosa—Red pine	1897	5	6	5	–	
Pinus Strobus—White pine	1890	7	–	8	9	
Pseudotsuga taxifolia—Douglas fir	1894	5	–	5	–	
Retinospora ericoides—Heath retinospora	1896	4	6	9	–	Removed 1930
Retinospora pisifera filifera—Thread retinospora	1916	2	10	3	3	
Taxus cuspidata—Japanese yew	1915	2	–	2	4	
Thuja occidentalis—American arbor-vitae	1890	5	9	7	10	
Thuja occidentalis columbia—Columbia arbor-vitae	1897	4	4	5	2	
Thuja occidentalis Douglasii aurea—Douglas golden arbor-vitae	1894	4	8	6	2	
Thuja occidentalis Ellwangeriana—Ellwanger arbor-vitae	1899	–	–	–	–	Removed 1917
Thuja occidentalis globosa—Globose arbor-vitae	1895	3	1	4	7	
Thuja occidentalis Hoveyi—Hovey arbor-vitae	1899	–	–	–	–	Removed
Thuja occidentalis Hoveyi aurea—Golden-leaved Hovey arbor-vitae	1897	4	4	6	–	Removed 1929
Thuja occidentalis variegata—Variegated arbor-vitae	1899	4	3	6	3	Removed 1929
Thuja occidentalis Wareana—Siberian arbor-vitae	1895	3	7	5	5	Removed 1929
Tsuga canadensis—Canada hemlock	1889	5	–	6	10	

European privet (*Ligustrum vulgare*), planted 1924, Central Experimental Farm, Ottawa, Ont., 1930.

Siberian Pea Tree (*Caragana arborescens*), planted 1911, Central Experimental Farm, Ottawa, Ont., 1930.

NOTES ON DECIDUOUS TREES AND SHRUBS TESTED FOR HEDGES AT THE CENTRAL EXPERIMENTAL FARM, OTTAWA, ONTARIO, 1889-1930

***Acer campestre (Hedge Maple).**—Planted 1895, height 4 feet 2 inches, width at base 8 feet, 1929. The Hedge Maple has made a good close hedge with branches to the ground all over. The foliage is fairly attractive. There are, however, better hedges. The original plants have killed to the ground and many branches have come up.

Acer ginnala (Amur Maple).—Planted 1894, removed 1911. The Amur Maple proved too open at the base for a good hedge. For a few days in the autumn it is attractive as the foliage always colours highly.

Acer glabrum (Rocky Mountain Maple).—Planted 1895; height 4 feet 8 inches, width at base 4 feet 9 inches in 1929. This maple has not made a satisfactory hedge. A few plants have died, making bad gaps and there is much dead wood in the hedge and it is not well clothed with branches on sides. It is so open that other shrubs have grown up in it.

Acer monspessulanum (Montpelier Maple).—Planted 1895. The Montpelier Maple winter killed too badly to make a satisfactory hedge.

Acer Negundo (Boxelder).—Planted 1891, removed 1919. The Boxelder made a fairly good hedge but it is such a strong grower and needs clipping so frequently that it eventually got out of hand and was removed when too tall to prune without difficulty.

Acer pennsylvanicum (Striped Maple).—Planted 1897, removed 1911. The Striped Maple, though a native of Eastern Canada, seems to thrive best in partial shade. It proved a failure as a hedge. Some specimens killed out and others did not thicken sufficiently.

Acer spicatum (Mountain Maple).—Planted 1897, removed 1911. This did not do well as a hedge. It would not thicken at the base. More a plant for partly shaded places than for bright sunlight.

Alnus glutinosa imperialis (Royal Alder).—Planted in 1897, removed 1930. There are only six of the original plants alive in this hedge. It is very open at the sides. Evidently of little value as a hedge, although foliage is attractive.

Alnus viridis (Green Alder).—Planted 1896. The Green Alder did not prove sufficiently hardy to make a good hedge at Ottawa.

Artemisia Abrotanum (Southernwood).—Planted 1896; height 2 feet, width at base 1 foot 3 inches in 1930. Does not make a satisfactory hedge as the branches are not sufficiently permanent. They keep killing or dying to the ground. The branches are also too soft for a hedge. It is interesting because the leaves are scented but it does not make a good hedge.

Artemisia Abrotanum tobolskianum.—Planted 1896, removed 1913. This is a larger growing variety than the species and is more satisfactory as a hedge plant.

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* The names of species used in this bulletin are according to the International Rules of Botanical Nomenclature; the common names are mainly those used in "Standardized Plant Names".

Berberis Thunbergii (Japanese Barberry).—Planted 1914; height 3 feet 8 inches, width at base 4 feet 7 inches in 1930, replacing a hedge planted in 1890 which was removed in 1913 because it was crowded. It was at that time 4 feet in height and 7 feet in width at base. This is the most satisfactory and most popular low-growing deciduous hedge. It will reach a height of 4 feet if desired. It has the good qualities for a hedge in being compact in habit with small attractive foliage and sufficiently firm to keep its shape well. The leaves become highly coloured in autumn and after they fall the scarlet berries give this hedge a pleasing appearance until it is covered with snow. When grown as an unclipped hedge it is very attractive and has much more fruit than when clipped, when there is very little, if any. So far the disease which causes the rust of wheat has not been found on this species so that it can be planted without fear of its doing harm to grain.

There is a dwarfer form of this called Box Barberry (*B. Thunbergii minor*) which is useful where a very small hedge is desired.

Berberis Thunbergii atropurpurea (Purple Japanese Barberry).—Planted 1926; height 1 foot 10 inches, width at base 1 foot 3 inches in 1930. This promises to make an excellent hedge with the good points of the ordinary Japanese Barberry but having attractive reddish-purple leaves.

Berberis Thunbergii minor (Box Barberry).—Planted 1924; height 1 foot 6 inches, width at base 1 foot 4 inches in 1930. Planted at eighteen inches apart, the bushes have not closed up yet and it would seem that twelve inches apart would be ample for this dwarf form of the Japanese Barberry. It is a promising plant where a slow growing, dwarf hedge is desired. The foliage is smaller than *Berberis Thunbergii.*

Berberis vulgaris (European Barberry).—Planted 1889, removed 1911. The lower part of the hedge of European Barberry became too open to make a satisfactory hedge.

Berberis vulgaris atropurpurea (Purple Barberry).—Planted 1889; height 5 feet, width at base 6 feet in 1930. The branches of this hedge are now dead near the ground over nearly all of this hedge but the upper half of the hedge is in good condition. Because of the attractive purple foliage and the fact that the lower branches die and thus do not injure plants near it the Purple Barberry makes a good background for a herbaceous border, when the lower part of the hedge where the branches are dead is hidden by the herbaceous perennials.

Betula alba pubescens (European White Birch).—Planted 1897; height 6 feet 2 inches, width at base 8 feet in 1929. There are sixteen plants only alive in this hedge. The good plants which are alive have foliage to near the ground and are fairly thick at the sides but, on the whole, the hedge is very broken and not promising as a permanent hedge.

Betula lutea (Yellow Birch).—Planted 1895; height 5 feet 9 inches, width at base 7 feet in 1929. The Yellow Birch has made a firm hedge and has stood pruning well. There are living branches to the ground, or near the ground, all over. The foliage is somewhat coarse, however, for an attractive hedge.

Betula nigra (River Birch).—Planted 1897; height 5 feet 9 inches, width at base 8 feet 2 inches in 1929. The hedge of River Birch is good, in most places, with foliage to near the ground. It is a stiff hedge though not very close. The best birch tested for hedge purposes.

Betula papyrifera (Canoe Birch).—Planted 1895; height 6 feet 7 inches, width at base 7 feet 5 inches in 1929. The Canoe Birch has not made a good hedge. Twenty plants only are alive and some of these are in poor condition. It has not made a close hedge. While there are some living branches to near the ground, in most places they are two feet or more above it.

Hungarian lilac (*Syringa Josikaea*), planted 1891, Central Experimental Farm, Ottawa, Ont., 1930.

Hungarian lilac (*Syringa josikaea*), planted 1891, Central Experimental Farm, Ottawa, Ont., 1930.

Betula populifolia (Gray Birch).—Planted 1897; height 6 feet 7 inches, width at base 9 feet in 1930. This has been a good hedge until recent years, but is now tending to get more open below. While branches over most of the hedge are still at or near the ground, in some places they are a foot or more above ground. Although the foliage of this hedge is attractive it is doubtful if it will be a long-lived hedge.

Calycanthus floridus (Common Sweetshrub).—Planted 1895, removed 1917. The Sweetshrub made a good hedge and living branches were retained to the ground, but the foliage is too coarse to make a pleasing hedge.

Caragana arborescens (Siberian Pea Tree).—Planted 1889, replanted 1911; height 5 feet 2 inches, width at base 4 feet 7 inches in 1930. The hedge which was planted in 1889 became too large to trim easily and was rooted up in 1925. At this time it was 9 feet 6 inches in height and 10 feet wide at its widest part. When removed it was still in good condition, clothed with living branches to the ground and had made an excellent hedge. The Siberian Pea Tree is, perhaps, the best tall deciduous hedge for the colder parts of Canada. It resists both drought and extreme cold very well. It is a fairly rapid grower and its leaves, which come out early, are of an attractive shade of green. As it makes practically all its growth early in the season one pruning each year is sufficient. This shrub-like tree will reach a height of 18 feet if desired. The Siberian Pea tree should be in full sunlight for best results as, if shaded, the bottom will become too open. The leaf hoppers have injured the appearance of this in recent years at Ottawa.

Caragana frutex (Russian Pea-shrub).—Planted 1896; height 6 feet 6 inches, width at base 7 feet in 1930. Because of its suckering habit this plant has made a hedge well clothed with branches to the ground. The foliage is attractive but the weakness of this hedge is that the branches are too pliant and bend with the weight of snow, resulting in the hedge remaining unshapely for a time each year. On the whole, however, it is a fairly good hedge.

Caragana pygmaea (Dwarf Pea-shrub).—Planted 1895; height 3 feet 5 inches, width at base 4 feet 9 inches in 1929. This has made an excellent, close, dwarf hedge with branches to near the ground all over. The foliage is somewhat dull in colour. One of the best low-growing hedges.

Carpinus betulus (European Hornbeam).—Planted 1897; height 3 feet 4 inches, width at base 7 feet 4 inches in 1929. The European Hornbeam has made a compact, firm, spreading hedge with branches to near the ground all over and may be considered a fairly satisfactory hedge at Ottawa. When grown in the form of a tree the European Hornbeam kills back at times.

Celtis occidentalis (Nettle Tree).—Planted 1891, removed. This made an even, firm hedge, but the foliage was not attractive enough to make it a promising species for hedge purposes.

Cornus alba sibirica (Coral Dogwood).—Planted 1896, removed. This is fairly satisfactory for a few years and then becomes too open at the bottom.

Cornus alba sibirica variegata (Variegated Coral Dogwood).—Planted 1895 and replaced 1896; removed. Specimens died from time to time, making an unsatisfactory hedge.

Cornus Amomum (Silky Dogwood).—Planted 1897; height 4 feet 10 inches, width at base 5 feet in 1929. This has not made a satisfactory hedge. The side branches have died to a height of four feet from the ground, although new shoots keep coming up to give foliage to the sides, but the hedge is not a good one.

Cornus Baileyi (Bailey Dogwood).—Planted 1897; height 7 feet 6 inches, width at base 9 feet in 1930. A fairly good hedge with living branches to near the ground over most of the hedge. This has been maintained mainly by the rooting of the lower branches. The foliage is not quite attractive enough to make it a desirable hedge.

Cornus stolonifera flaviramea (Goldentwig Dogwood).—Planted 1924; height 4 feet 2 inches, width at base 4 feet 2 inches in 1930. Sometimes it is desirable to have something conspicuous in the landscape in the dormant season and a hedge of this yellow-barked dogwood furnishes this. During winter the bark is quite yellow in marked contrast to the red bark of the Red Osier Dogwood or Tartarian Dogwood. So far this has stood pruning well.

Cotoneaster acutifolia (Peking Cotoneaster).—Planted 1896, removed. This made a very attractive hedge in its early years, as it has small, glossy, attractive, green leaves and stands pruning well. It is, however, very subject to the attacks of oyster-shell scale at Ottawa and constant vigilance is necessary to keep this insect under control. It was decided eventually to remove the hedge, as many branches became weakened by the scale and it was becoming unsightly.

Cotoneaster integerrima (European Cotoneaster).—Planted 1896; height 4 feet 11 inches, width at base 7 feet in 1930. The foliage of this plant is not sufficiently bright in colour to make an attractive hedge, being rather dull in appearance. About twenty-five per cent of the original plants have died and the hedge is grown up with other shrubs. Branches are living to the ground on those plants which are alive.

Cotoneaster microphylla (Rockspray).—Planted 1895. This was winter-killed the first winter. Not hardy at Ottawa.

Cotoneaster rotundifolia buxifolia (Box Cotoneaster).—Planted 1895. This was winter-killed the first winter. Not hardy at Ottawa.

Cotoneaster Simonsii (Simon Cotoneaster).—Planted 1895. This was winter-killed the first winter. Not hardy at Ottawa.

Crataegus crus-galli (Cockspur Thorn).—Planted 1913. The English Hawthorn so much used in Great Britain and, to some extent, in the milder parts of America, is not hardy enough at Ottawa to make a good hedge, but the Cockspur Thorn has proven to be an excellent substitute. It stands pruning well, is very thorny, has very glossy attractive foliage and, up to the present, has made a good hedge. It became, however, infested with oyster-shell scale, which weakened and made unsightly a small section of it until the insects were controlled. Other species of native hawthorn would, no doubt, make good hedges also.

Cydonia Maulei (Lesser Flowering Quince).—Planted 1894, removed 1911. This made a fair hedge but individual specimens were winter-killed, making an uneven hedge. It was also of too spreading habit.

Cytisus elongatus.—Planted 1894, removed. Specimens killed out in hedge and plants were too open at base. Not satisfactory.

Cytisus supinus (capitatus) (Bigflower Broom).—Planted 1894, removed. Not satisfactory. Specimens killed out.

Deutzia scabra crenata.—Planted 1894, removed. Killed back too badly to make satisfactory hedge.

American Arbor-vitae (*Thuja occidentalis*), planted 1911, Central Experimental Farm, Ottawa, Ont., 1930.

General view of hedges, west to east, Central Experimental Farm, Ottawa, Ont.

Eleagnus angustifolia (Russian olive).—Planted 1917; height 2 feet 8 inches, width at base 2 feet 3 inches in 1929. The Russian olive has made a poor hedge at Ottawa. Fourteen plants only are alive and of these the side branches are nearly all dead. This tree may need a drier climate, although some individual specimens have done well on the lawns.

Euonymus americanus (Brook Euonymus).—Planted 1897, removed 1911. This did not thicken up well and did not make a good hedge.

Fagus americana (American Beech).—Planted 1897; height 5 feet 10 inches, width at base 7 feet 4 inches in 1930. The American Beech has made a good firm hedge and, except for a small break where one plant has not done well, it is well clothed with living branches to near the ground. The foliage is not quite so attractive as the European but the latter is not hardy at Ottawa. The foliage remains late on this hedge.

Fagus sylvatica (European Beech).—Planted 1895, removed 1913. The European Beech did not prove hardy at Ottawa, hence it was of no value as a hedge plant here.

Gleditsia triacanthos (Honey Locust).—Planted 1889; height 9 feet 3 inches, width 7 feet 7 inches in 1930. The Honey Locust is too rampant a grower in its early life to make a desirable hedge, as it needs so much attention. Some fourteen of the original plants have died so that there are gaps which are not fully filled. A few plants have branches to near the ground.

Another Honey Locust hedge was planted in 1895. This has made a better hedge than the other. In this case the plants were set much closer together, only six inches apart. About eighteen of the original plants have died but the plants are still quite thick enough. Part of the hedge which is not shaded has branches eighteen inches or less from the ground. Height 6 feet 3 inches, width at base 5 feet 3 inches in 1929. While a very thorny hedge and a good one for holding stock, the Honey Locust requires too much care for a hedge which is desired for ornamental purposes only.

Hamamelis virginiana (Common Witch-hazel).—Planted 1913; height 3 feet 7 inches, width 3 feet 9 inches in 1930. The foliage of this shrub is rather coarse to make it an attractive hedge. It is only fairly compact, but there are living branches to near the ground. Not a very satisfactory hedge.

Hippophae rhamnoides (Common Sea-buckthorn).—Planted 1895, removed 1915. The Sea-buckthorn killed out in places and did not make a satisfactory hedge at Ottawa.

Hydrangea paniculata grandiflora (Peegee Hydrangea).—Planted 1915; height 3 feet 3 inches, width at base 2 feet 3 inches in 1930. The Peegee Hydrangea is not a satisfactory hedge plant from a foliage standpoint as the leaves are coarse and the lower branches die, but it is very attractive when in bloom and by pruning back severely late in autumn, or before growth starts in the spring, fine bloom may be obtained each year.

Larix europaea (European Larch).—Planted 1897; height 3 feet 8 inches, width at base 4 feet 7 inches in 1930. The European Larch had made a good hedge until recent years, but there are now several dead patches on the sides which disfigure it. These seem to have been caused by snow lying on it. It has made a compact, firm hedge and has living branches to the ground.

Larix laricina (American Larch).—Planted 1895; height 4 feet 6 inches, width at base 5 feet 6 inches in 1929. The American Larch or Tamarack has made a very good hedge and is almost perfect so far as being clothed with living

branches to near the ground is concerned. It has made a close, firm hedge and the fact that it leafs out very early in the spring is in its favour. The foliage is of an attractive shade of green.

Ligustrum ibota Regelianum (Regal Privet).—Planted 1926; height 1 foot 10 inches, width at base 1 foot 6 inches in 1930. While this privet has not been planted long enough to develop into a good hedge, it promises to make a satisfactory one. This is a very hardy privet and the attractive shade of purple, which the leaves take on in the autumn, adds interest to it.

Ligustrum vulgare (European Privet).—Planted 1924; height 3 feet 7 inches, width at base 2 feet 10 inches in 1930. This privet has not done well in the present situation but an older hedge planted in 1894, and removed to make way for another hedge, did well and made a good hedge plant. In some years, however, it kills back somewhat, rendering it unsightly for a time in the early part of summer. The original plants used for hedge purposes at the Central Experimental Farm were received from the Arnold Arboretum under the name of *Ligustrum amurense*, but later was found to be a northern form of *L. vulgare*. The true *L. amurense* has not been thoroughly tested at Ottawa.

Lonicera tatarica (Tartarian Honeysuckle).—Planted 1896; height 6 feet, width at base 7 feet in 1930. The foliage of this Honeysuckle is not sufficiently attractive for a hedge. The green of the leaves is too dull. The leaves sometimes mildew also. This hedge is very open at the base, over the greater part of the hedge, to a height of from two to three feet from the ground. The variety known as *L. tatarica elegans* was also planted in 1896 but could not be distinguished in foliage or habit from the species. Its height in 1930 is 5 feet 9 inches; width at base 7 feet 9 inches.

Malus baccata aurantiaca (Siberian Crab).—Planted 1897, removed 1911. This was not sufficiently attractive to leave and was removed when young to make room for something else.

Malus niedzwetzkyana x P. baccata var. (Purple-leaved Crab apple).—Planted 1926; height 1 foot 10 inches, width at base 1 foot in 1929. Second generation seedlings of the above cross, having purple leaves, have been used for hedge purposes. There is not yet time to tell what kind of a hedge they will make but the plants are making moderate growth.

Morus alba tatarica (Russian Mulberry).—Planted 1889; height 9 feet 3 inches, width at base 10 feet 3 inches in 1930. This has made a very large hedge. It is too strong a grower to be satisfactory for hedge purposes. Some fourteen of the original plants have died but the gaps are pretty well covered over by the growth from this plant. The leaves are too coarse to be attractive. This hedge is now between nine and ten feet high with a spread of about ten feet.

Philadelphus coronarius aureus (Golden Mockorange).—Planted 1894, removed 1911. The leaves of the Golden Mockorange are of an attractive yellow but there was too much dead wood in the hedge for it to be a satisfactory hedge.

Philadelphus coronarius nanus (Dwarf Mockorange).—Planted 1898, removed 1911. This made a poor hedge. It was very dwarf and the foliage not attractive enough.

Philadelphus coronarius primulaeflorus (Double Flowered Mockorange).—Planted 1894, removed. There was too much dead wood in this to have an attractive hedge.

Philadelphus grandiflorus (Big Scentless Mockorange).—Planted 1897; height 7 feet 10 inches, width at base 7 feet 6 inches in 1929. This has made a close, firm hedge with foliage to the ground, or near the ground, practically all over. The foliage is, however, rather coarse for this to make a very attractive hedge.

Philadelphus Lewisii (cordifolius) (Lewis Mockorange).—Planted 1897; height 4 feet 9 inches, width at base 4 feet 3 inches in 1929. This has made a poor hedge. It has killed back badly from year to year. While there are many young branches with younger branches to near the ground, the hedge is not attractive.

Physocarpus opulifolius (Ninebark).—Planted 1896, removed.—The Ninebark stood pruning well but the foliage was somewhat coarse to make a very pleasing hedge. It was removed to make room for another hedge.

Physocarpus opulifolius aureus (Goldleaf Ninebark).—Planted 1890; height 7 feet 6 inches, width at base 11 feet 3 inches in 1930. The Goldleaf Ninebark is a very strong grower and soon makes a large hedge if desired. The foliage is somewhat coarse, however, for a very attractive hedge though, if one wants a tall yellow-leaved hedge, this makes a good one, as the leaves are of a good shade of yellow. This hedge is now about 8 feet high and 9 feet across and has foliage to the ground over most parts of the hedge.

Populus nigra italica (Lombardy Poplar).—Planted 1896. This has made a poor hedge. The plants have died to the ground from time to time and there have not been sufficient new branches to keep the hedge thick. Not desirable as a hedge.

Prunus americana (American Plum).—Planted 1894, removed 1915. The American plum became too open at the bottom. The foliage was too coarse also for an attractive hedge.

Prunus Grayana (Japanese Bird Cherry).—Planted 1910, removed 1919. This was making a fairly good hedge though the foliage was somewhat coarse, but it became badly affected with black knot disease and was removed.

Prunus mahaleb (Mahaleb Cherry).—Planted 1897, removed. The Mahaleb cherry did not prove hardy enough, some specimens killing out altogether.

Prunus pennsylvanica (Pin Cherry).—Planted 1898, removed. This did not make a good hedge. It became very open at the base and was removed in 1913.

Prunus serotina (Black Cherry).—Planted 1897; height 6 feet 5 inches, width at base 6 feet 4 inches in 1929. While the foliage of the Black Cherry is fairly attractive, it has not made a satisfactory hedge. It is very open at the bottom over most of its length and living branches do not come within two feet of the ground.

Ptelea trifoliata (Common Hoptree).—Planted 1898; height 3 feet 5 inches, width at base 2 feet 4 inches in 1929. This has made a very poor hedge. The plants kill back badly from time to time and it does not thicken up at the bottom.

Pyrus communis (Common Pear).—Planted 1897, height 5 feet 6 inches, width at base 5 feet 9 inches in 1929. The pear has not made a satisfactory hedge at Ottawa. About one-half of the original plants are dead and shrubs of various kinds have grown up through the hedge as the trees which are alive, while making a stiff, thorny hedge, are open at the sides.

White pine (*Pinus Strobus*), planted 1890, Central Experimental Farm, Ottawa, Ont., 1930.

Shingle oak (*Quercus imbricaria*), planted 1913, Central Experimental Farm, Ottawa, Ont., 1930.

Quercus imbricaria (Shingle Oak).—Planted 1913; height 5 feet 7 inches, width at base 5 feet 6 inches in 1930. The Shingle Oak has made a very attractive hedge. The glossy entire leaves are very suggestive of laurel and where laurel cannot be grown, as at Ottawa, this makes a good substitute. This hedge is well clothed with branches to near the ground. The leaves remain on the hedge until winter, which gives it a longer time in foliage than most others. A fine hedge, one of the most satisfactory so far.

Quercus palustris (Pin Oak).—Planted 1895, removed. Some plants were winter-killed and on this account it was not possible to make a good hedge.

Quercus robur (English Oak).—Planted 1895; height 6 feet, width at base 8 feet 10 inches in 1929. The English Oak has made a good hedge. It is firm, stands pruning well and has branches living to the ground practically all over. The foliage is not, however, as attractive as the Shingle Oak.

Rhamnus cathartica (Common Buckthorn).—Planted 1895; height 6 feet 6 inches, width at base 6 feet 4 inches in 1929. The Common Buckthorn makes a firm hedge but the foliage is not so attractive as some others. It is now very open at the base, the branches being dead to a height of from two to three feet. A good plant for hedge purposes, but not sufficiently attractive.

Rhamnus Frangula (Alder Buckthorn).—Planted 1890 and 1895. The former hedge was removed in 1911 because of crowding another hedge. Height of hedge planted in 1895 6 feet 6 inches; width at base 8 feet 4 inches in 1929. A third hedge was planted in 1912.

The Alder Buckthorn makes an excellent hedge but it is evident that it would not be satisfactory in a colder climate than Ottawa as in some winters and under certain soil conditions, such as when the soil is wet, it has been injured at Ottawa. The foliage is relatively small, glossy, and of an attractive shade of green and has been practically uninjured by insects or diseases. The first hedge that was planted was in excellent condition until its removal, being well covered with foliage to the ground. The honey bee visits the inconspicuous flowers of the Alder Buckthorn very freely. It is a much more attractive hedge than the Common Buckthorn, though not so firm.

Ribes alpinum (Mountain Currant).—Planted 1916; height 1 foot 9 inches, width at base 1 foot 10 inches in 1929. The Mountain Currant has made a compact, firm hedge, with branches to the ground, except a part which has not done well, due no doubt to some soil condition. The foliage is a little coarse looking for a high class hedge.

Ribes odoratum (Golden Currant).—Planted 1898, removed 1915. This plant, usually grown under the name of *Ribes aureum*, did not make a good hedge, not thickening up well. By 1915 it was dying out in places and was removed.

Rosa rubiginosa (Sweet Briar).—Planted 1890, removed. The Sweet Briar was found to be too straggling and strong a grower to be satisfactory for hedge purposes.

Rosa rubrifolia (Redleaf Rose).—Planted 1890, removed. This was found unsuitable for hedge purposes. The hedge was too open, especially at the base.

Rosa rugosa (Japanese Rose).—Planted 1890, removed 1911. The Japanese rose, while standing pruning well, is not firm enough for a hedge and is liable to become too wide.

Salix acutifolia (Sharpleaf Willow).—Planted 1896, removed 1915. Not sufficiently attractive, this hedge was removed when young to make way for something more attractive.

Salix incana (S. rosmarinifolia) (Rosemary Willow).—Planted 1898, removed 1915. There was too much dead wood in this hedge each year for a satisfactory hedge so it was removed in 1915.

Salix pentandra (Laurel Willow).—Planted 1913, removed. While this has made an excellent hedge in the prairie provinces, where its glossy leaves show to great advantage, at Ottawa the leaves became affected with galls, making the hedge unsightly.

Salix vitellina (S. Voronesh) (Golden Willow).—Planted 1898, removed. This made a fair hedge but there was too much dead wood in it each year for a satisfactory hedge and it was removed after 1913.

Shepherdia canadensis (Russet Buffalo Berry).—Planted 1897, removed. This made a fair hedge for about ten years, when it began to get thin at the bottom and the base gradually became more open.

Sorbus americana (American Mountain Ash).—Planted 1898, removed. The American Mountain Ash would not thicken at the base and proved quite unsatisfactory as a hedge. It was removed after 1913.

Sorbus Aucuparia (European Mountain Ash).—Planted 1898; height 6 feet 5 inches, width at base 4 feet 2 inches in 1929. This has proved of little value as a hedge. There are few side branches remaining. Some plants have died. A very open looking hedge.

Spiraea arguta (Garland Spirea).—Planted 1898; height 4 feet 4 inches, width at base 4 feet 7 inches in 1929. The Garland Spirea has made a fairly satisfactory hedge. The small foliage is attractive. The hedge is, however, rather open at the bottom, ranging from one to two feet above the ground without branches in some places.

Spiraea chamaedryfolia (Germander Spirea).—Planted 1896, removed 1913. There was too much dead wood in this hedge for it to be attractive.

Spiraea Douglasii (Douglas Spirea).—Planted 1894, removed. There was too much dead wood in this hedge each year to have an attractive hedge.

Spiraea nipponica rotundifolia (Big Nippon Spirea).—Planted 1894, removed. This proved too tender for a hedge at Ottawa as it was badly injured by winter.

Spiraea Vanhouttei (Vanhoutte Spirea).—Planted 1891, removed. The Vanhoutte Spirea did not make a satisfactory clipped hedge. It proved too open at the base and individual specimens died leaving gaps in the hedge. As an unclipped hedge, however, where the plants are permitted to assume their graceful form and bloom, it is very attractive.

Symphoricarpus racemosus (Common Snowberry).—Planted 1890, removed. This was found to make a rather weak-growing and straggling hedge at Ottawa. The wood usually killed at the tips. It suckers, which is objectionable.

Syringa chinensis (Rouen or Chinese Lilac).—Planted 1890, removed. The Rouen lilac, well known under the name of *Syringa rothomagensis*, was found to be too loose and open in growth although the small foliage was attractive. This should make a very attractive unclipped hedge as it is one of the freest blooming lilacs, flowers well annually and the bush is graceful.

Syringa japonica (Japanese Tree Lilac).—Planted 1911; height 4 feet 9 inches, width at base 4 feet 6 inches in 1930. While this has not made a very dense hedge the foliage is more attractive than either the Common or Chinese lilacs but not as pleasing as the Hungarian lilac. There are living branches to the ground and the foliage is good.

Syringa Josikaea (Hungarian Lilac).—Planted 1891; height 9 feet, width at base 11 feet 6 inches in 1930. Very good condition 1930. This species has made the most attractive and best lilac hedge. It is very hardy. The foliage is glossy and of an attractive shade of green and has been practically free from insects and diseases. The plants are well clothed with branches to the ground. It is one of the finest and best of the many hedges under test at Ottawa.

Syringa villosa (Chinese Lilac).—Planted 1911; height 5 feet 4 inches, width at base 6 feet 1 inch in 1930. This has made a firm, dense hedge with living branches to the ground but the leaves are not as attractive as *S. Josikaea*, which is preferred. The Chinese lilac is very hardy and for this reason and where *S. Josikaea* cannot be obtained, it might be sometimes used where a tall hedge is desired.

Syringa vulgaris (Common Lilac).—Planted 1890; height 11 feet 2 inches, width at base 14 feet 7 inches in 1930. A hedge of common lilac will reach any height desired for a hedge, up to eighteen or twenty feet. The one planted in 1890 has been kept to about 11 feet in height and 14 feet in width. While the foliage is fairly attractive in the early part of the season, the common lilac is very subject to mildew on the foliage, which often makes it rather unsightly in late summer. It suckers badly also, although this has kept this hedge clothed with leaves to the ground. But because of this suckering habit the hedge is liable to become too wide. The Hungarian lilac is so superior that it should be used instead if a lilac hedge is desired.

Ulmus americana (American Elm).—Planted 1889, removed 1911. The American Elm hedge was removed in 1911 because it was too open, particularly at the base, for a satisfactory hedge.

Viburnum Lantana (Wayfaring Tree).—Planted 1890; height 7 feet, width at base 10 feet 4 inches in 1930. The Wayfaring tree has made one of the best of the taller hedges. After thirty-eight years this hedge is still in excellent condition. It is dense and the branches are living to the ground. The foliage is attractive and free from insects and diseases. The leaves remain green and hang later than most deciduous shrubs which have been tried for hedge purposes.

Viburnum Opulus (European Cranberry Bush).—Planted 1894, removed 1911. This made a strong growth and stood clipping well but the foliage is rather coarse for an attractive hedge.

Weigela Sieboldii variegata (Silveredge Weigela).—Planted 1896, removed 1913. This did not prove sufficiently hardy to make a good hedge.

Zanthoxylum americanum (Common Prickly-ash).—Planted 1889; height 7 feet 6 inches, width at base 6 feet 5 inches in 1930. This native shrub has stood well as a hedge plant and while it is rather open near the ground it has made an almost impenetrable hedge because of the numerous sharp thorns. The suckers have helped in places to keep living foliage near the ground. The leaves of the Prickly-ash are, however, rather coarse for an attractive hedge.

NOTES ON EVERGREEN TREES AND SHRUBS TESTED FOR HEDGES AT THE CENTRAL EXPERIMENTAL FARM, OTTAWA, ONT., 1889-1930

Abies balsamea (Balsam Fir).—Planted 1897; height 3 feet 9 inches, width at base 5 feet 2 inches in 1930. The Balsam Fir has made a good close hedge and has stood the annual pruning well. There are still living branches to near the ground all over the hedge. The foliage is of an attractive shade of green.

Juniperus communis hibernica (Irish Juniper).—Planted 1891, removed 1911. There was so much killing of the tips of the Irish Juniper each winter that it was a long time each season before it was attractive again, furthermore it was injured by the weight of snow, hence it did not prove a satisfactory hedge.

Juniperus communis suecica (Swedish Juniper).—Planted 1897; height 5 feet 4 inches, width at base 9 feet in 1930. The Swedish Juniper has not made a satisfactory hedge for, while the branches are living too near the ground in most places over the hedge, and the foliage is attractive in colour, it is too soft and spreads easily with the weight of snow and does not close up properly. The tips of the branches winter-kill also, leaving brown patches through the season.

Juniperus Sabina (Savin).—Planted 1897, removed. The Savin proved of too soft and spreading a growth to make a satisfactory hedge.

Juniperus virginiana (Red Cedar).—Planted 1913; height 4 feet, width at base 4 feet 1 inch in 1930. The Red Cedar has made a dense hedge, with foliage to the ground on about half of it and to within a foot of the ground on the rest. The colour of the leaves is too dull a green for a satisfactory hedge, though it might be useful in dry places. Some of the more attractive leaved varieties of it, such as *elegantissima, glauca* and *Schottii,* would no doubt make more interesting hedges.

Picea canadensis (White Spruce).—Planted 1889; height 4 feet 6 inches, width at base 4 feet 8 inches in 1930. This hedge is still in good condition with living branches to the ground over most of the hedge. It has escaped the chief insect enemies of this spruce, the Spruce Gall aphis and Spruce Budworm. Because of the attacks of these insects, often severe, the planting of White Spruce for hedge purposes is not recommended for the Ottawa district.

Picea excelsa (Norway Spruce).—Planted 1889, removed 1911. This made a good compact hedge but in time it became too large and broad and was removed in 1911. The foliage is not so attractive as some other evergreens.

Picea pungens Kosteriana (Koster Blue Spruce).—Planted 1914; height 4 feet 5 inches, width at base 3 feet 9 inches in 1930. So far this very blue form of the Colorado Spruce has made a very good hedge. Its steely blue colour is very striking and it has made a compact, firm hedge with foliage alive to near the ground nearly all over. As individual specimens on the lawns begin to fail after about thirty years, at Ottawa, it is doubtful if all the specimens in the hedge will remain in good condition any longer, if as long as that.

Pinus Banksiana (Jack Pine).—Planted 1909, removed. The Jack Pine stood pruning very well and was well clothed with branches to the ground but had to be removed as it was too close to another hedge. It was, however, a little coarse looking to make a very attractive hedge, but in districts of very poor soil, where few evergreens succeed, it would make a good plant for a tall hedge or screen.

Goldentwig dogwood (*Cornus stolonifera flaviramea*), planted 1924, Central Experimental Farm, Ottawa, Ont., 1930.

Thread retinospora (*Retinospora pisifera filifera*), planted 1916, Central Experimental Farm, Ottawa, Ont., 1930.

Pinus Cembra (Swiss Stone Pine).—Planted 1894; height 4 feet 6 inches, width at base 4 feet 10 inches in 1930. This tree has made an excellent hedge, being dense and firm and the foliage is of an attractive shade of green, much the colour of the White Pine. The dying of two of the trees in the hedge in recent years has caused temporary gaps which, however, are filling fast. It is well clothed with living branches to the ground over practically all the hedge.

Pinus mugo mughus (Mugho Pine).—Planted 1916; height 3 feet 10 inches, width at base 3 feet 10 inches in 1930. A good hedge has been made of this tree and there are live branches to the ground over nearly all of the hedge. The green of this pine is rather deep and dull so it is not so attractive in appearance as some others.

Pinus ponderosa (Western Yellow Pine).—Planted 1895. This has proved of little value for hedge purposes. The branches have died to a height of four feet or more. It is too open. Only fifteen of the original plants are alive.

Pinus resinosa (Red Pine).—Planted 1897; height 5 feet 6 inches, width 5 feet in 1930. The Red Pine hedge is still clothed with branches to the ground on the west side where it has not been shaded. It is rather too coarse looking to be especially attractive and the hedge is not dense enough.

Pinus Strobus (White Pine).—Planted 1890; height 7 feet, width at base 8 feet 9 inches in 1930. The White Pine has made an attractive and satisfactory hedge and after forty years is still in good condition, with living branches to the ground or near the ground. Because of its soft, light green foliage it is very striking in appearance and much admired. Being a native species it is quite hardy at Ottawa and during all the years since it was planted it has never been injured by winter. It has also been practically free from disease and insects.

Pseudotsuga taxifolia (Douglas-fir).—Planted 1894; height 5 feet, width at base 5 feet in 1930. Until recent years the Douglas-fir had made a very good hedge but during the past few years a few dead spots have appeared in the sides but these may fill in. On the east side the branches are dead to about one foot above the ground. This has made a firm hedge of attractive appearance and has stood pruning well for over thirty years.

Retinospora ericoides (Heath Retinospora).—Planted 1896; height 4 feet 6 inches, width 9 feet in 1930. This is really a juvenile form of *Thuja occidentalis,* having small soft needles or leaves. This hedge is well covered with foliage to the ground but the branches are so soft or weak that the weight of snow spreads the hedge and makes it unsightly. Moreover, the tips are frequently injured, injuring the appearance until new growth has been made. The colour of the leaves in winter is rather dull to be pleasing. Not desirable for a hedge.

Retinospora pisifera filifera (Thread Retinospora).—Planted 1916; height 2 feet 10 inches, width at base 3 feet 3 inches in 1930. This has made a good, hardy, compact, firm hedge. The foliage is attractive and, while the colour is rather light for winter, it is a satisfactory hedge. There are living branches to the ground all over.

Taxus cuspidata (Japanese Yew).—Planted 1915; height 2 feet, width at base 2 feet 4 inches in 1930. While a very slow grower, this is making an excellent hedge and is a good substitute for the English Yew which is not hardy at Ottawa. It is now about two feet high. The lower branches are from six to ten inches off the ground. The foliage of the Japanese Yew is of an attractive dark green colour. It promises to be the best hardy evergreen for a low hedge.

Thuja occidentalis (American Arbor-vitae).—Planted 1890; height 5 feet 9 inches, width at base 7 feet 10 inches in 1930. Also planted 1911; height 5 feet, width at base 3 feet 10 inches in 1930. More than a mile of American Arbor-vitae was planted for a hedge at the Central Experimental Farm in 1888. Where it has not been injured by dense shade from overhanging trees or from some other special cause the hedge from this planting is still in excellent condition, with living branches and leaves to the ground. It has been kept to about six feet in height and six feet across. This is undoubtedly the best evergreen hedge for climatic conditions such as obtain at Ottawa. It can be readily kept at a medium height or let grow tall, as desired. It stands clipping well, will endure shade better than most plants, is only a moderate grower, lessening the amount of pruning which would otherwise be necessary, and is easily kept looking well trimmed for most of the year. It succeeds in a great variety of soils. It is also very hardy. It has another great advantage in that in many places it can readily be dug up in the pastures or woodlands, costing nothing but the labour of transplanting. Very early in the spring seems the best time to move Arbor-vitae. In planting, the specimens with few or no branches near the ground may be set deeper than the others so as to have all the plants, when set, with good branches close to the ground. The hardiest variety of the American Arbor-vitae would seem to be the so-called Siberian Arbor-vitae (*Thuja occidentalis Wareana*) which, however, has a little coarser look than the ordinary form. Other varieties are dwarfer and they are very suitable where a low-growing evergreen hedge is desired. Among these may be mentioned the Globose Arbor-vitae (*Thuja occidentalis globosa*) and Compact Arbor-vitae (*Thuja occidentalis compacta*), and the Douglas Golden Arbor-vitae makes a very striking yellow foliaged variety.

Thuja occidentalis columbia (Columbia Arbor-vitae).—Planted 1897; height 4 feet 4 inches, width at base 5 feet 2 inches in 1929. This is, perhaps, the most attractive Arbor-vitae hedge in the collection. The slight silvery variegation which shows, lightens up this hedge, making it more attractive than the ordinary forms. The foliage comes to near the ground all over the hedge, which is compact and good.

Thuja occidentalis Douglasii aurea (Douglas Golden Arbor-vitae).—Planted 1894; height 4 feet 8 inches, width at base 6 feet 2 inches in 1930. This hedge is in practically perfect condition and anyone who desires a golden-leaved evergreen hedge should be well satisfied with this variety, as in summer it is an attractive shade of yellow. The branches are living close to the ground. This is a dense, firm hedge.

Thuja occidentalis Ellwangeriana (Ellwanger Arbor-vitae).—Planted 1899, removed 1917. This made a good hedge at first but by 1913 it was badly scalded on the east side, doubtless because of snow lying on it late. It was so badly injured that it was removed in 1917. As an individual specimen this variety has been one of the freest from injury of any of the varieties of American Arbor-vitae.

Thuja occidentalis globosa (Globose Arbor-vitae).—Planted 1895; height 3 feet 1 inch, width at base 4 feet 7 inches in 1929. This Arbor-vitae has made a good hedge, although the foliage is duller in colour than some other forms of American Arbor-vitae. There is foliage to the ground over most of the hedge, but the east side has been injured at some time, doubtless by snow or ice.

Thuja occidentalis Hoveyi aurea (Golden-leaved Hovey Arbor-vitae).—Planted 1897; height 4 feet 4 inches, width at base 6 feet in 1929. This has made an excellent hedge, with living branches to the ground, or near the ground, all over, but is no better than the common American Arbor-vitae.

White spruce (*Picea canadensis*), planted 1889. Central Experimental Farm, Ottawa, Ont., 1930.

Koster blue spruce (*Picea pungens' Kosteriana*), planted 1914. European cotoneaster (*Cotoneaster integerrima*) alongside, planted 1896, Central Experimental Farm, Ottawa, Ont., 1930.

Thuja occidentalis Hoveyi (Hovey Arbor-vitae).—Planted 1899, removed. This was injured so much by winter that the hedge was removed.

Thuja occidentalis variegata (Variegated Arbor-vitae).—Planted 1899; height 4 feet 3 inches, width at base 6 feet 3 inches in 1929. While this has made a very satisfactory hedge, with living branches to the ground, it is no better than the ordinary American Arbor-vitae.

Thuja occidentalis Wareana (Ware or Siberian Arbor-vitae).—Planted 1895; height 3 feet 7 inches, width at base 5 feet 5 inches in 1929. This has made as good a hedge as other varieties of *Thuja occidentalis* and, being hardier than other varieties, is valuable for colder places. The foliage being a deeper green than some others it is of a more attractive colour in winter than the type, but the foliage is coarser. Parts of the east side of this hedge have been injured, doubtless where snow has lain.

Tsuga canadensis (Canada Hemlock).—Planted 1889; height 5 feet, width at base 6 feet 10 inches in 1930. While a very slow grower, this has made an excellent hedge and is in almost perfect condition after forty-one years since it was planted. There are living branches to the ground practically all around the hedge. The small, bright green leaves are attractive. The height is now about five feet and the width seven feet. A desirable hedge where a low hedge will be sufficient for some years.

BEST HEDGES AT CENTRAL EXPERIMENTAL FARM, OTTAWA

TALL DECIDUOUS HEDGES

Hungarian lilac—*Syringa Josikaea.*
Siberian pea tree—*Caragana arborescens.*
Cockspur thorn—*Crataegus crus-galli.*
River birch—*Betula nigra*

MEDIUM HEIGHT DECIDUOUS HEDGES

Wayfaring tree—*Viburnum Lantana.*
Alder buckthorn—*Rhamnus Frangula.*
Shingle oak—*Quercus imbricaria.*

LOW GROWING DECIDUOUS HEDGES

Japanese barberry—*Berberis Thunbergii.*
Purple Japanese barberry—*Berberis Thunbergii atropurpurea.*
Dwarf caragana—*Caragana pygmaea.*

TALL EVERGREEN HEDGES

Douglas fir—*Pseudotsuga taxifolia.*
Norway spruce—*Picea excelsa.*
White pine—*Pinus Strobus.*
White spruce is also very good.

MEDIUM HEIGHT EVERGREEN HEDGES

American arbor-vitae—*Thuja occidentalis.*
Canada hemlock—*Tsuga canadensis.*
Swiss stone pine—*Pinus Cembra.*
Heath retinospora—*Retinospora pisifera filifera.*

LOW GROWING EVERGREEN HEDGES

Japanese yew—*Taxus cuspidata.*
Globose arbor-vitae—*Thuja occidentalis globosa.*

BEST HEDGES AT THE BRANCH EXPERIMENTAL STATIONS

Tests have been made at most of the Branch Experimental Stations of many species of trees and shrubs for hedge purposes, as at the Central Experimental Farm, Ottawa, and the following lists of the six best hedges at each Station have been furnished by the Superintendents of these Stations. These are given in order of merit.

CHARLOTTETOWN, P.E.I.

Japanese barberry—*Berberis Thunbergii.*
American arbor-vitae—*Thuja occidentalis.*
White spruce—*Picea canadensis.*
Alder buckthorn—*Rhamnus Frangula.*
Cockspur thorn—*Crataegus crus-galli.*
Hungarian lilac—*Syringa Josikaea.*

KENTVILLE, N.S.

Norway spruce—*Picea excelsa.*
(White spruce is about as good).
Japanese barberry—*Berberis Thunbergii.*
English hawthorn—*Crataegus Oxyacantha.*
European privet—*Ligustrum vulgare.*
Japanese quince—*Cydonia japonica.*
Common buckthorn—*Rhamnus cathartica.*

NAPPAN, N.S.

White spruce—*Picea canadensis.*
Norway spruce—*Picea excelsa.*
Swiss stone pine—*Pinus Cembra.*
Douglas fir—*Pseudotsuga taxifolia.*
Japanese barberry—*Berberis Thunbergii.*
European privet—*Ligustrum vulgare.*
Common buckthorn—*Rhamnus cathartica.*

FREDERICTON, N.B.

American arbor-vitae—*Thuja occidentalis.*
Japanese barberry—*Berberis Thunbergii.*
European larch—*Larix europaea.*
Siberian pea tree—*Caragana arborescens.*
Hungarian lilac—*Syringa Josikaea.*
Colorado spruce (Blue Form)—*Picea pungens glauca.*

STE. ANNE DE LA POCATIÈRE, P.Q.

Siberian pea tree—*Caragana arborescens.*
Laurel willow—*Salix pentandra.*
American arbor-vitae—*Thuja occidentalis.*
White spruce—*Picea canadensis.*
Japanese barberry—*Berberis Thunbergii.*
Chinese lilac—*Syringa villosa.*

CAP ROUGE, P.Q.

Evergreen:
American arbor-vitae—*Thuja occidentalis.*
Colorado spruce (Blue Form)—*Picea pungens glauca.*
White spruce—*Picea canadensis.*

Deciduous:

Japanese barberry—*Berberis Thunbergii.*
Siberian pea tree—*Caragana arborescens.*
Wayfaring tree—*Viburnum Lantana.*

LENNOXVILLE, P.Q.

Evergreen:

American arbor-vitae—*Thuja occidentalis.*
White spruce—*Picea canadensis.*

Deciduous:

Common buckthorn—*Rhamnus cathartica.*
Chinese lilac—*Syringa villosa.*
Cockspur thorn—*Crataegus crus-galli.*
European larch—*Larix europaea.*

KAPUSKASING, ONT.

Laurel willow—*Salix pentandra.*
Siberian pea tree—*Caragana arborescens.*
White spruce—*Picea canadensis.*
Dwarf caragana—*Caragana pygmaea.*
Coral dogwood—*Cornus alba sibirica.*
Thicket shadblow—*Amelanchier oblongifolia.*

BRANDON, MAN.

Siberian pea tree—*Caragana arborescens.*
White spruce—*Picea canadensis.*
Tartarian honeysuckle—*Lonicera tatarica.*
Hungarian lilac—*Syringa Josikaea.*
Amur maple—*Acer ginnala.*
Native plum—*Prunus americana.*

INDIAN HEAD, SASK.

Siberian pea tree—*Caragana arborescens.*
Tartarian honeysuckle—*Lonicera tatarica.*
Peking cotoneaster—*Cotoneaster acutifolia.*
Amur maple—*Acer ginnala.*
* White spruce—*Picea canadensis.*
Dwarf caragana—*Caragana pygmaea.*

ROSTHERN, SASK.

White spruce—*Picea canadensis.*
Red-osier dogwood—*Cornus stolonifera.*
Siberian pea tree—*Caragana arborescens.*
Dwarf caragana—*Caragana pygmaea.*
Common lilac—*Syringa vulgaris.*
Pin cherry—*Prunus pennsylvanica.*

SCOTT, SASK.

Siberian pea tree—*Caragana arborescens.*
Russian pea-shrub—*Caragana frutex.*
White spruce—*Picea canadensis.*
Amur maple—*Acer ginnala.*
Hungarian lilac—*Syringa Josikaea.*
Tartarian honeysuckle—*Lonicera tatarica.*

LETHBRIDGE, ALTA.

Siberian pea tree—*Caragana arborescens.*
Cockspur thorn—*Crataegus crus-galli.*

* Makes the best hedge but most difficult to transplant.

Cockspur thorn (*Cratægus crus-galli*), planted 1913, Central Experimental Farm, Ottawa, Ont., 1930.

American beech (*Fagus americana*), planted 1897, Central Experimental Farm, Ottawa, Ont., 1930.

Hungarian lilac—*Syringa Josikaea.*
Russian pea-shrub—*Caragana frutex.*
Green ash—*Fraxinus lanceolata.*
Japanese tree lilac—*Syringa Japonica.*

LACOMBE, ALTA.

White spruce—*Picea canadensis.*
Siberian pea tree—*Caragana arborescens.*
Laurel willow—*Salix pentandra.*
Chinese lilac—*Syringa villosa.*
Dwarf caragana—*Caragana pygmaea.*
Lodgepole pine—*Pinus Murrayana.*

WINDERMERE, B.C.

Deciduous hedges:
Laurel willow—*Salix pentandra.*
Golden willow—*Salix vitellina.*
Siberian pea tree—*Caragana aborescens.*
Chinese lilac—*Syringa villosa.*
Hungarian lilac—*Syringa Josikaea.*
Coral dogwood—*Cornus alba sibirica.*

Evergreen hedges:
White spruce—*Picea canadensis.*
Douglas fir—*Pseudotsuga taxifolia.*
Colorado Juniper—*Juniperus scopulorum.*

SUMMERLAND, B.C.

European privet—*Ligustrum vulgare.*
Japanese barberry—*Berberis Thunbergii.*
Hungarian lilac—*Syringa Josikaea.*
Russian olive—*Elaegnus angustifolia.*
English hawthorn—*Crataegus Oxyacantha.*
American arbor-vitae—*Thuja occidentalis.*

AGASSIZ, B.C.

Tall Evergreen:
Canada hemlock—*Tsuga canadensis.*
English holly—*Ilex Aquifolium.*

Medium and Low Evergreen:
Irish yew—*Taxus baccata hibernica.*
Common box—*Buxus sempervirens.*

Tall Deciduous.
European beech—*Fagus sylvatica.*
English hawthorn—*Crataegus Oxyacantha.*

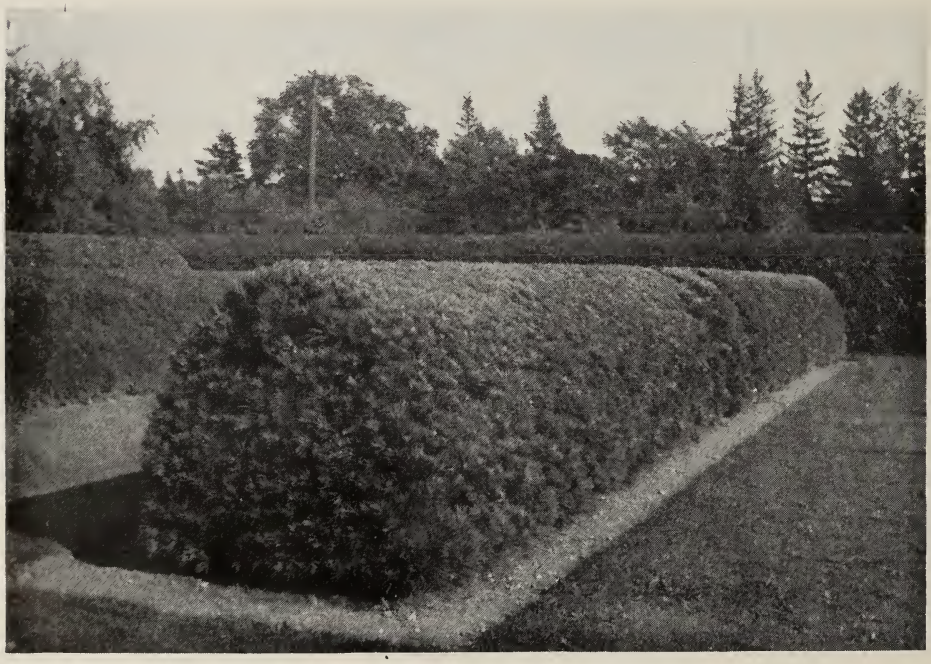
Medium Deciduous:
Slender Deutzia—*Deutzia gracilis.*
European privet—*Ligustrum vulgare.*

Low Deciduous:
Rosemary willow—*Salix incana.*
Japanese barberry—*Berberis Thunbergii.*

SAANICHTON, B.C.

Laurel—*Laurocerasus officinalis.*
European privet—*Ligustrum vulgare.*
Giant arbor-vitae—*Thuja plicata.*
Laurustinus—*Viburnum Tinus.*
Rockspray—*Cotoneaster microphylla.*
English holly—*Ilex Aquifolium.*

Douglas Golden Arbor-vitae (*Thuja occidentalis Douglasii aurea*), planted 1894, Central Experimental Farm, Ottawa, Ont., 1930.



Swiss stone pine (*Pinus Cembra*), planted 1894, Central Experimental Farm, Ottawa, Ont., 1930.

GOOD HEDGES WITH ATTRACTIVE FOLIAGE

When one has large grounds it is not so important to have hedges with very attractive foliage as it is when the area is small, as in a large place where the hedge may be seen at a distance the general effect may be all that is desired, but where a hedge is seen at close range every day and several times in one day it is important to have one with foliage that is pleasing to the eye. Undoubtedly the best low-growing hedge of this kind is the Japanese Barberry (*Berberis Thunbergii*). The leaves are attractive through the summer and in the autumn when they turn red the hedge is even still more ornamental. The Purple Japanese Barberry, with its reddish-purple leaves, is also very pleasing to the eye.

Among the tall deciduous hedges the Hungarian Lilac (*Syringa Josikaea*) is one of the most attractive. The leaves are glossy and quite a deep shade of green. The Cockspur Thorn (*Crataegus crus-galli*) makes a very satisfactory hedge and the glossy leaves are pleasing to the eye. On account of the large thorns, however, it is, perhaps, not so desirable on a small place as the lilac. A third tall deciduous hedge, which has had much favourable comment, is the Shingle Oak (*Quercus imbricaria*). The foliage of this oak is not cut at the edges like most oaks but the leaf is entire, glossy and of an attractive shade of green. The whole hedge is very suggestive of a hedge of laurel.

The most striking looking spruce hedge is the blue form of the Colorado Spruce (*Picea pungens*) but there are those who do not care for such a conspicuous hedge.

The Swiss Stone Pine (*Pinus Cembra*) has made an excellent hedge. It is a slow compact grower with foliage suggestive of the White Pine and many persons have admired this hedge at Ottawa, as they have the native White Pine (*Pinus Strobus*), which after forty years is still in good condition and a very attractive hedge.

The American Arbor-vitae (*Thuja occidentalis*) is the best all-round evergreen hedge but anyone desiring something with a golden tinge will get it in Douglas Golden Arbor-vitae. Another variety which is outstanding is Columbia, with variegated tips, a most pleasing hedge.

The Hemlock (*Tsuga canadensis*) is one of the most charming of all hedges and after forty years is in almost perfect condition. It is a slow grower but where one can do with a low hedge for some time, but has enough room for it to ultimately reach a large size, it is very desirable.

HEDGES WITH CONSPICUOUS FOLIAGE IN SUMMER

Sometimes a hedge is desired with foliage which is not green. Among evergreens the blue form of the Colorado Spruce (*Picea pungens*) makes a good hedge of this kind. The steely-blue colour of the foliage is very noticeable and pleasing to many persons. The variety known as the Koster Blue Spruce is very uniform in colour but selected blue seedlings are satisfactory.

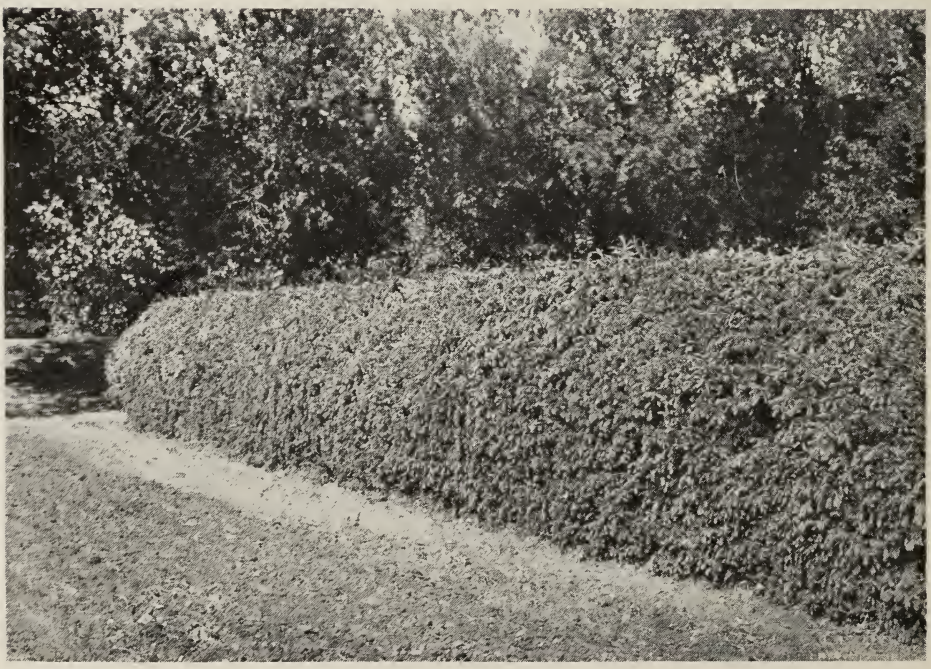
Another evergreen with conspicuous foliage, which has been much admired at Ottawa, is the Douglas Golden Arbor-vitae. This has made an excellent hedge and the golden-yellow colour of the foliage is attractive.

A hedge which is much admired is the Purple Japanese Barberry (*Berberis Thunbergii atropurpurea*). The reddish-purple foliage of this is very pleasing. It does not become a host for the wheat rust, as does the purple-leaved form of the European Barberry, so can be planted without fear.

Occasionally a hedge with greyish foliage is desired and with the Russian Olive (*Eleagnus angustifolia*) one can have this. While this has not done very well at Ottawa it has made a good hedge in some places.

If one desires a tall deciduous hedge with yellow foliage the best at Ottawa has proved to be the Goldleaf Ninebark (*Physocarpus opulifolius aureus*).

Gray birch (*Betula populifolia*), planted 1897, Central Experimental Farm, Ottawa, Ont., 1930.



White spruce (*Picea canadensis*), Experimental Farm, Brandon, Man.

HEDGES WITH CONSPICUOUS BARK IN WINTER

Sometimes one likes to have a deciduous hedge with conspicuous bark in winter and there are a few plants that may be used for this purpose with good effect. The Golden Willow (*Salix vittelina*) makes a fairly good tall hedge, apart from its striking yellow bark in winter and if one wants this golden effect it may be obtained by using this species, as the bark is quite yellow in winter. Or, if a tall red-barked hedge for winter effect is desired, the Bronze Golden Willow (*Salix vitellina britzensis*) may be used. The bark of this is very brilliant in colour during the winter months.

If lower growing hedges are wanted for winter effect the native Red-osier Dogwood (*Cornus stolonifera*) may be used or the Coral Dogwood (*Salix alba sibirica*), both of which have red bark, the latter being the brighter. At Ottawa this last shrub has not made a good hedge for long. The Oyster-shell scale affects it very much. A striking yellow-barked hedge is the Goldentwig Dogwood (*C. stolonifera flaviramea*), which is very effective in winter.

HEDGES FOR SHADY PLACES

Some kinds of trees and shrubs will do much better in shade than others. The American Arbor-vitae endures shade very well and, being the best evergreen hedge in other respects, makes it especially valuable where the hedge is shaded. The Canada Hemlock also stands shade very well, as does the Japanese Yew. The Wayfaring Tree (*Viburnum Lantana*), which is one of the best deciduous hedges, does very well in shade. The privets are shade enduring, as are the dogwoods. Deutzias also succeed in shade. The Alpine currant (*Ribes alpinum*) withstands shady conditions pretty well and the Japanese Barberry, though thriving much better in bright sunlight, does fairly well under some shade.

HEDGES TO STOP CHILDREN OR ANIMALS

There are a few hedges which are particularly valuable for stopping children or home or farm animals because of their thorny nature.

The best low-growing hedge for this purpose is the Japanese Barberry (*Berberis Thunbergii*), which is firm, close and prickly and, although it does not reach a height of much more than four feet, is effective against small children and small animals. The next hedge which may be mentioned is the Cockspur Thorn (*Crataegus crus-galli*), which is a tall-growing, very thorny hedge, and will stop larger animals. The foliage is glossy and it makes a good ornamental hedge. We prefer it to the Honey Locust (*Gleditsia triacanthos*), which is also a very thorny hedge and quite attractive, but it makes such strong growth that it is difficult to keep within bounds; moreover it has been the experience at Ottawa that odd specimens die from time to time, leaving gaps in the hedge. However, this is not so likely to occur where the climate is milder.

The English Hawthorn (*Crataegus Oxyacantha*) makes an excellent hedge for this purpose where the winters are not so severe as at Ottawa, but here it kills back badly.

Until it was found to be a host of wheat rust the Common Buckthorn (*Rhamnus cathartica*) was highly recommended as a tall hedge for stopping animals, but now it is not planted to any extent. It makes a good ornamental hedge and is sufficiently thorny to hold animals.

In southern Ontario the Osage-orange (*Maclura pomifera*) has been used to some extent as a hedge to hold animals. It is popular in some parts of the United States. It is not hardy in Eastern Ontario or further east.

Lilac hedge in bloom, Experimental Farm, Brandon, Man.

General view of hedges, Experimental Station, Rosthern, Sask. (Photo by Wm. A. Munro)

QUICK-GROWING SCREENS

It is often desirable to make a screen as quickly as possible to hide something unsightly and, while it is usually a better policy to wait a little longer for a really satisfactory permanent hedge to develop, something that will grow rapidly and make a fairly good hedge is often preferred, especially if it will be sufficiently high. The best plants for this purpose are the poplars and willows.

Lombardy Poplar.—Where a narrow, tall, quick-growing screen is desired the Lombardy Poplar is one of the best trees to plant. It is very useful for hiding, in a short time, unsightly buildings and vacant lots. It is also a good tree to use as a quick growing windbreak and may be planted from three to eight feet apart, depending on how quickly a continuous screen is desired. Carolina Poplar and Cottonwood also make good screens.

The Laurel Willow (*Salix pentandra*) is the most attractive looking willow. The leaves are sometimes affected with gall insects at Ottawa, which disfigure it somewhat, but over a wide area in the colder parts it has made an excellent screen and hedge. The Golden Willow (*Salix vitellina*) may also be used as a screen.

All of these, with the exception of the Lombardy Poplar, must be kept trimmed back severely or they become too wide.

Climbing roses make quick screens when on a trellis, but are too uncertain in the colder parts, but other hardy climbers may be used.

Good screens can, however, be made with single specimens or groups of shrubs which sometimes are preferable to use instead of a hedge.

FLOWERING HEDGES

Sometimes a hedge is desired that will make a boundary, a screen and a bank of flowers as well and there are some shrubs that are quite satisfactory for this purpose, although most of those with ornamental flowers do not bloom well, if at all, when they are kept as clipped hedges. This being so it is well to plant those which, though not trimmed, do not grow too large, which have, if possible, a graceful form and which will bloom well.

Spiraea Vanhouttei—Van Houtte Spirea.—Perhaps the best shrub for this purpose is the Van Houtte Spirea, the pendulous nature of which makes it very attractive at any time, but when covered with bloom in June is very fine. It will reach a height of six feet or more if left untrimmed.

Spiraea arguta—Garland Spirea.—Though not so graceful as the Van Houtte Spirea it is very satisfactory as an unclipped hedge and blooms earlier than *S. Vanhouttei.* It will reach about the same height.

Deutzia gracilis—Slender Deutzia.—This deutzia is a compact grower and can stand being left untrimmed for a year without its getting out of bounds. By clipping in alternate years one can have a fine display of bloom every other year and, if trimmed immediately after blooming each year, one may have some bloom every year. It is only, however, where this has proved hardy that it should be grown. It grows about four feet high.

Roses.—Many roses may be used as hedges but the hardiest ones, such as the Japanese Rose (*Rosa rugosa*), Harison Yellow, Persion Yellow and others, sucker too much and soon become too wide. The F. J. Grootendorst, however, does not sucker much, is an upright grower and, even though it is grown as a clipped hedge, will bloom on the new wood more or less all summer.

General view of hedges, white spruce hedge in foreground, Experimental Station, Lacombe, Alta.

Canada hemlock (*Tsuga canadensis*), Experimental Farm, Agassiz, B.C.

Climbing roses can, of course, be grown on trellises or fences and make attractive screens where they are hardy, but in many parts of Canada cannot be depended upon for the purpose.

Hydrangea paniculata grandiflora—Peegee Hydrangea.—This well-known shrub makes a very striking hedge or screen when in full bloom but should occupy a place where it will not be much noticed in the early part of summer. To have it bloom well it should be cut back hard in early spring. The foliage is not very attractive and, apart from the bloom, is not a satisfactory hedge.

Lilacs.—The common lilac, (*Syringa vulgaris*) suckers too much to grow as an untrimmed hedge, unless one has abundance of room, as it soon becomes too wide. If kept trimmed it will not bloom. Where one has much space it can be let grow at will and makes a delightful sight at blooming time.

It will be noticed in the general notes on hedges that the Hungarian Lilac (*Syringa Josikaea*) is one of the best general purpose hedges. This lilac does not sucker and, though the bush in its natural form becomes almost, if not quite, as tall as the common lilac, it should make a very attractive, tall, untrimmed hedge. It blooms later than the common lilac and, while the flowers are not so attractive and are not sweet-scented, it blooms well. The Chinese or Late Lilac (*Syringa villosa*) has a wide adaptation also and while the foliage is not so attractive as the Hungarian, it makes a good, tall, flowering hedge.

Weigela.—The Weigela is not sufficiently hardy at Ottawa to be grown as a hedge for any purpose, but in parts of Ontario where it succeeds it makes an attractive flowering hedge of four to five feet in height, as desired.

Lonicera tatarica—Tartarian Honeysuckle.—A row of bush honeysuckle in bloom makes a most attractive sight in May, but, as with the lilac, much space is needed when this is grown untrimmed, as it may ultimately have a spread of ten to twelve feet. Grown as a clipped hedge it does not bloom.

Philadelphus—Mockorange.—This is another shrub which does not bloom when clipped every year and does not make a very satisfactory clipped hedge. It is however so attractive when in bloom that if one has large grounds a hedge or screen of Mockorange makes a very charming feature in the landscape. There are now so many varieties of Mockorange that one may have them from two or three feet in height, by using the lower growing varieties, to ten feet or more by growing the very tall species, such as *Philadelphus grandiflorus*. One of the most graceful and ornamental of the taller varieties of Mockorange is the species known as *P. brachybotrys*.

WINDBREAKS

It is often desirable, where the grounds are large, to have a windbreak on one or more sides that will check the force of the wind and make it much pleasanter to walk about in cool windy weather. Windbreaks, especially evergreen ones, are very serviceable in winter in protecting the house, outbuildings and farmyard, if it is a farm, from the wind, although a more attractive form of protection, especially near the house, is obtained by planting irregular groups rather than straight rows.

One of the best trees to plant for a windbreak in Eastern Canada is the Norway Spruce (*Picea excelsa*). It is a rapid-growing evergreen and is hardy almost everywhere where apples can be grown successfully. A single row of these planted from eight to ten feet apart is quite sufficient. It should be kept in mind that they will eventually have a spread of twenty-five or thirty feet. In very exposed places it may be desirable to plant two rows of trees, the trees forming the second row being planted from eight to ten feet behind the trees

in the first row. The first row may be composed of American Arbor-vitae, which are rather slow growing, and the row behind made of Norway Spruce, if desired. White Pine and European Larch are rapid growing trees which may be used for this purpose. Scotch Pine is inclined to be irregular in growth. Austrian Pine makes a fine, quick growing tree for a windbreak. Lombardy Poplar, planted eight feet apart, makes a windbreak in a short time as it is a very fast growing tree. The windbreak should be at least sixty feet away from the buildings it is desired to protect. If planted closer the accumulation of snow may be too great.

On the prairies the native White Spruce (*Picea canadensis*) is one of the best trees for a windbreak and trees are planted closer together, as quick protection is more necessary than in Eastern Canada.

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