Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

UNITED STATES DEPARTMENT OF AGRICULTURE

MISCELLANEOUS CIRCULAR NO. 16

WASHINGTON, D. C.

AUGUST, 1925

TREE DISTRIBUTION UNDER THE KINKAID ACT OF 1911

PREPARED BY THE FOREST SERVICE

Annually since 1911 the agricultural appropriation act has contained a provision for the free distribution of young trees from the Bessey Nursery, Nebraska National Forest, Halsey, Nebr., as follows:

That from the nurseries on the Nebraska National Forest the Secretary of Agriculture, under such rules and regulations as he may prescribe, may furnish young trees free, so far as they may be spared, to residents of the territory covered by "An act increasing the area of homesteads in a portion of Nebraska," approved April 28, 1904.

The act referred to is commonly known as the Kinkaid Act, and the portion of Nebraska included is shown on the map (fig. 1).

Under the foregoing provision, trees have been distributed as follows:

Year	Number of applicants	Number of trees distributed	Year	Number of applicants	Number of trees distributed
1912.....	494	44,460	1920.....	698	119,180
1913.....	540	189,000	1921.....	680	104,600
1914.....	712	248,500	1922.....	829	170,400
1915.....	746	112,110	1923.....	1,041	206,100
1916.....	770	131,200	1924.....	970	195,650
1917.....	704	127,550			
1918.....	586	122,900	Total.....	9,298	1,877,445
1919.....	528	106,395			

The reports sent in by those who have received the trees indicate that they obtain as high as 75 per cent survival in favorable seasons and as low as almost total failure in seasons of drought. An average of about 50 per cent of the trees planted live. Some planters who take unusually good care of their trees obtain almost perfect stands. There are scattered groves of trees all through western Nebraska, many of which were planted under the timber culture act of March 13, 1874, locally called the "tree claim" law.¹ Where

¹ This law as amended by the act of June 14, 1878, authorized the entry of a quarter section or less of treeless land for the purpose of timber culture. The law required that the entryman should plant, protect, and keep in a healthy growing condition for 8 years 10 acres of timber on a quarter section, 5 acres on an 80, or 2½ acres on a 40-acre tract. No residence on the land was required.

fire and stock have been kept out these wood lots are furnishing their owners with shelter for buildings and stock, as well as a supply of fuel and farm-repair material. (Figs. 2 and 3.)

Jack pines planted at Halsey in 1903 by the Forest Service had an average diameter at the end of 1924 of 4.8 inches at breast

FIG. 2.—Jack pine and cottonwood plantation protecting a farmhouse in Holt County, Nebr.

height—4½ feet above the ground—and an average height of 24 feet. (Fig. 4.) The maximum diameter and height is 6.1 inches and 32 feet. The accumulation of pine needles on the ground and the shading out of the grass and the lower branches of the trees indicate that forest conditions now prevail. Later plantations have

FIG. 3.—Cottonwood and western yellow pine planted on the north and west of a ranch house in Thomas County, Nebr.

had a survival of from 50 to 85 per cent on the roughest and lightest sand hills in the State. About 10,000 acres have been successfully planted here by the Federal Government, and it is evident that tree raising is no longer an experiment in this territory, formerly considered so inhospitable to tree growth.

OBJECTS OF TREE DISTRIBUTION AND PLANTING

The main object of the tree distribution by the Government is to stimulate interest in forest-tree growing, chiefly for the production of fuel and fence posts and the establishment of windbreaks. With proper care, woodlot plantations should begin to yield fence posts and firewood in 15 years. Since trees will do well on soils not suitable for farm crops, profitable use can be made of what might otherwise be unproductive areas. Furthermore, the establishment of windbreaks and wood lots makes living conditions pleasanter and adds materially to the value of the property.

THE SELECTION OF SITES FOR PLANTING

The influence of the site, such as north slope, south slope, ridge top, and bottom, strongly affects the growth of various trees species. It is probable that the greatest success will come from planting on the

FIG. 4.—Fifteen-year jack pine planted in the sand hills of the Nebraska National Forest, Thomas County, Nebr.

north slopes, where the soil is generally more moist and is protected to some extent from the drying heat of the sun. Frost leaves the ground on the north slopes a little later in the spring, but by the time the season is far enough advanced for planting (generally March 15 to 30) the soil will be in excellent condition for planting. Where the ground is level, or nearly so, the choice of site is, of course, not governed by topographical conditions: one place is as good as another.

WHEN TO PLANT

The rainfall at Halsey averages 21 inches a year, but in the extreme western portion of the State it amounts to only 15 inches.

The period from April 1 to June 30 is marked by more than the average rainfall. Records show that 42 per cent of the total rainfall for the whole year comes in the three months of April, May, and June. It is very important, therefore, to begin planting imme-

diately after the frost leaves the ground, so that the trees can get the full benefit of the spring rains.

SPECIES TO PLANT

There are several trees suitable for planting in this district, and a brief discussion of the characteristics of each is given to assist the planter in selecting those which will best suit his particular needs.

Those which are likely to give the best satisfaction are the coniferous or "evergreen" trees. Western yellow pine, Scotch pine, Austrian pine, jack pine, and red cedar will grow in this region. Some of the hardwoods (deciduous or broadleaf trees) that will grow are cottonwood (fig. 5), American elm, honey locust, hackberry, green ash, Russian olive, Chinese elm, and black walnut.

Hardwoods require more moisture and better soil than pines, and also require cultivation to insure success. Most of the land in the Kinkaid district is characterized by a sandy soil which can not be

FIG. 5.—Cottonwood plantation at the University of Nebraska substation, North Platte, Nebr.

safely cultivated because of blowing. It is therefore obvious that pines, which do not have to be cultivated, are in general best suited to the region and that hardwoods should be employed only where the better grades of soil are found or where some local conditions favor their growth. In addition, evergreens make a more satisfactory wind-break, because the foliage remains on the trees throughout the year. The timber produced is also of better grade than that of the ordinary hardwoods grown in the sand hills.

The degree of success that will follow planting depends largely on the care exercised in selecting the site on which the trees are planted. Some trees will do better on a north slope, others on a ridge; most of the hardwood species will succeed best in the bottoms. The man who expects to get results must consider the requirements of the different species he is planting.

All of these species are not available every year, but so far as possible trees best suited to the land to be planted are sent to each applicant. No fruit trees are furnished from this nursery.

JACK PINE

Jack pine is hardy and rapid growing. It will grow on poor soil, but requires plenty of light. The wood is light, moderately strong, coarse grained, and suitable for rough construction and for posts when treated with a preservative material.

The jack pine will grow well even on south slopes where there is little moisture and where many other trees have failed. (Fig. 6.) From the standpoint of utility it is not the most desirable tree, but its ability to grow on poor soil makes it valuable. Because of its shallow-root system, it may die out during the periods of extreme drought in open stands where grass is abundant. Overcrowding also will cause the weaker trees to die. It can not be recommended for heavy loam or clay soils.

WESTERN YELLOW PINE

Western yellow pine is one of the hardiest of the trees that can be grown in this region. It will do well on ridges and north slopes

FIG. 6.—A ranch home in Loup County, Nebr. Pine trees in foreground distributed under the Kinkaid Act

or in the pockets, and responds to cultivation with increased growth. It thrives best in pure stands (that is, unmixed with other species) and grows rapidly enough to establish itself within a few years. It is probably the most valuable tree that can be grown in this part of the country and should give more uniform success than any other species. The growth for the first few years is slow, but after the fifth year it may grow from 12 to 18 inches annually. The growth of this tree is often set back by the pine-tip moth, an insect the larvae of which bores through the buds and tender shoots and kills them.

SCOTCH AND AUSTRIAN PINES

Scotch and Austrian pines have been planted extensively in the eastern and central parts of the State, and they will do well in the western half if planted on north and east exposures. If available, the Riga or northern European variety of Scotch pine should be planted. Scotch pine planted at Halsey on a north exposure aver-

aged, at the end of 18 years' growth, 3.9 inches in diameter at breast height and 22 feet in height. The maximum growth attained was 6.7 inches in diameter and 29 feet in height. Austrian pine is a slower growing species, but is very hardy and is practically immune to the attack of the pine tip moth. Scotch pine is not quite so resistant to the moth as Austrian. Both species will do well on sandy soil as well as on the heavier loam soils.

EASTERN RED CEDAR

Eastern red cedar occurs naturally in the river valleys and along the adjacent bluffs in central and western Nebraska. It is somewhat difficult to start from seed and does not transplant so readily as the other conifers. It makes a rapid growth. A windbreak in Holt County, planted in 1911 on a sandy flat, averaged 25 to 30 feet in height and 5.8 inches in diameter at the close of 14 years' growth. This species should not be planted close to orchards, because of the presence of the "cedar apple" fungus, which damages apple trees.

HARDWOODS

Hardwoods should be planted in heavier and moister soils than conifers, preferably in tilled bottoms. They should be cultivated until the trees have grown too large to work between the rows. Cottonwood makes a very good growth in this region, but it is short-lived and is subject to attacks of borers and to canker.

American elm, honey locust, and hackberry are well adapted to planting in this region because of their ability to grow on dry soils and to resist severe frosts without injury, but cultivation is necessary until the trees are well established. Russian olive adapts itself to arid soils. Green ash will grow on the moister situations, but its growth is slow and it is subject to attacks of insects.

Chinese elm is a very rapid growing and hardy tree wherever it has been planted in western Nebraska. Black walnut can also be successfully grown in well-protected valleys where the water level is not too far below the surface.

SHIPMENT AND CARE OF TREES

Trees may be shipped from the nursery by parcel post, provided stamps are sent to the forest supervisor, United States Forest Service, Halsey, Nebr., before February 1 of each year. Planters will be notified at least one month before this date of the amount of postage required. Unless mail shipment is requested the trees will be sent by express, charges collect.

The trees will be shipped in bundles that will allow free circulation of air to the tops. The roots will be packed in damp moss to prevent drying out. Young trees, especially pines, are very tender and susceptible to injury. If the roots are exposed to the air, even for only a few minutes, they are likely to be injured, or killed entirely. If special care is exercised in handling the stock, a more successful plantation will result. Trees should not be left around the depot or post office longer than is absolutely necessary. It is best to plant the trees immediately after receiving them. If this can

not be done, they should be stored in a cellar or some cool, moist place, or heeled in as shown in Figure 7. The tops of evergreens in packages should not be wet; if there is any danger of the roots becoming dry, they should be moistened not soaked. This can be done by pouring a small quantity of water over the stems at the top of the package, allowing it to trickle down into the roots and moss.

METHOD OF PLANTING

When ready to plant, the trees should be taken out of the package, or from the ground where they have been heeled in, and placed in a box or bucket which contains some of the moss in which the trees were originally packed. The roots should be surrounded by wet moss and the trees themselves covered with a piece of wet burlap. When planting, the trees should be drawn from the bucket or box one at a time and put into the ground with as little exposure as possible.

Care in planting trees is as important as care in handling them.

FIG. 7.—Heeling in. This should always be done if the trees can not be planted immediately. Dig trench in moist earth deep enough to bury the roots and part of the stems allowing the roots to hang down full length, covering each layer of roots as placed. Do not double or curl them. Each layer of roots should not be more than 2 inches deep and the thickness of the soil over the roots should always exceed the depth of the layer of the roots

If they are not given careful attention when they are set in the ground, they can not be expected to live. Correct and incorrect methods of planting are shown in Figure 8.

The best way to plant evergreens is to plow a furrow and place the trees in slits made with a spade, as shown by Figures 9 and 10. These furrows can be plowed in sod in the sand hill region where there is danger of soil blowing; and the trees will require no cultivation, unless the planter desires to stimulate their growth. Success in tree planting can not be expected if the trees are stuck in sod and left to care for themselves, for the grass will crowd them out. This grass competition is greatly reduced by plowing a furrow, the method used in the planting operations on the Nebraska National Forest. Trees planted in the heavier loam soils should always be cultivated.

Hardwoods, if small rooted, may be planted in furrows in the same manner as conifers, or, if roots are large, by the deep-hole

method, illustrated in Figure 11, but always in prepared ground. The hole should be large and deep enough to accommodate all the roots without crowding. Hold the tree upright with roots in natural position, and cover the roots with loose, moist soil, tamping as shown. Watering at the time of planting is always advisable, especially in dry seasons and on sandy soils. Wind shields, such as shingles or narrow slats, set to protect the plant from the prevailing winds, are often necessary on exposed areas. Hardwoods should be cultivated for at least three years after planting, or until it is impossible to work between the rows.

FIG. 8.—Correct and incorrect methods of planting. A.—Good planting; the tree will live if firmly set. B.—Careless planting; the tree, set too deep and the roots crowded, will very likely die. C.—Very careless planting; the tree is set too shallow; will surely die. D.—Careless planting; sod, grass, or dry sand tamped around roots will dry the roots, and the tree will die. E.—Careless planting; the tree if set too deep on a hillside will be covered by soil rolling from above

The trees should be planted in rows about 6 feet apart and spaced from 3 to 5 feet apart in the rows. This will give room enough for development and cultivation, and in normal years will not leave the trees too far apart if there are some losses.

PROTECTION OF THE PLANTATIONS

To prevent the destruction of the plantations by prairie fires a double firebreak should be plowed around the trees. If the trees are included within the firebreak plowed for the protection of the home property, an extra break is unnecessary.

A fence should be constructed to keep out cattle, horses, and other stock. This is a most important point, since stock are likely to trample or eat the young trees. Most plantations can not be grazed for several years after planting.

FIG. 9.—First steps in planting. Plant hardwoods on prepared ground and cultivate until trees have grown together so as to shade out the grass

FIG. 10.—Successive steps in planting

Gophers probably destroy more trees than any other agent in western Nebraska. The young trees are often covered by the mounds thrown out by the gophers. The rodents also gnaw off the roots of trees that are up to 6 feet or more in height. When fresh gopher mounds are discovered among the trees, it is necessary to take action at once with traps or poison. Several good gopher traps are on the

market, and trapping is the surest method of exterminating these rodents.

Potatoes, carrots, or parsnips cut up into small pieces and sprinkled with powdered strychnine make a good poison bait. A small quantity of saccharine or oil of anise should also be added to disguise the bitter taste of the strychnine. The runways, which are usually 4 to 8 inches beneath the surface, can be located with an iron rod or probe. When found, drop one or two baits into the hole, without disturbing the soil any more than is necessary.

FIG. 11.—Deep-hole method of planting. This method should be used only when hardwoods are to be planted. A.—Dig the hole. B.—Partially cover the roots with loose moist earth. C.—Tamp the dirt firmly about the roots before filling the hole. D.—After filling the hole press the soil firmly about the roots by a thrust of the heel.

HOW TO OBTAIN TREES

Only the person owning or operating a farm may receive trees. Applications for trees from other members of the family on the farm will not be accepted.

A form of "Application and agreement" may be obtained from the forest supervisor, United States Forest Service, Halsey, Nebr. Before any trees are distributed this application must be properly filled out and signed. Upon the receipt of the signed agreement the supervisor will distribute the trees in proportion to the number of

applications and the quantity of nursery stock available. A sample form of the agreement follows:

Form 490.

APPLICATION AND AGREEMENT FOR YOUNG TREES, NEBRASKA NATIONAL FOREST

I, ———, a resident of that portion of Nebraska lying within the boundaries described in the act of April 28, 1904 (33 Stat., 547), entitled "An act to amend the homestead laws as to certain unappropriated and unreserved lands in Nebraska," under the provisions of the act of March 4, 1911 (36 Stat. 1235), entitled "An act making appropriations for the Department of Agriculture for the fiscal year ending June thirtieth, nineteen hundred and twelve," do apply for young trees for planting within the area above referred to.

The ground on which I desire to plant trees comprises an area of ——— acres, and is described as follows: Section ———, township ———, range ———.

Aspect: (Faces north, south, east, or west, or is it flat?) —————

Slope: (Steep or gentle?) —————

Grass and sod: (Heavy or light?) —————

Soil: (Loam, sandy loam, or sand?) —————

Cultivation: If hardwoods are desired, have you cultivated the ground on which to plant them? —————

The purpose of this planting is (shade, windbreak, or wood lot?) —————

In consideration of the granting of this application I promise and agree to plant all trees received by me and to care for them in the manner described in a circular of the Forest Service, Department of Agriculture, entitled "Tree Distribution Under the Kinkaid Act, 1911," and in accordance with any later instructions received by me from the Forest Service. I further promise to mail to the forest supervisor, Halsey, Nebr., on a card, Form 491, prepared for this purpose, not later than November 1 of each year, for three years after the date of the latest planting done by me, a statement showing the number of trees of each year's planting which are surviving in the area I have planted and the number of trees which I desire to plant during the following season. And I also agree to permit any representative of the Department of Agriculture to enter my premises at any reasonable time for the purpose of investigating the condition of the trees planted by me and the care which they have been given.

I further agree, immediately upon receipt of notice of shipment of any trees sent to me, to take them without delay from the post office or express or railroad company transporting them, and to pay all of the costs of their transportation, or to send stamps prior to February 1 of each year for their shipment by parcel post. If any package of trees is received by me in bad condition as a result of carelessness or long period in transit, I agree to accept the same without protest and immediately to notify the forest supervisor, Halsey, Nebr.

It is further agreed that if the trees received by me at any time are not planted, or are sold or otherwise disposed of, I am to forfeit the right to receive any more trees under the provision of the act of March 4, 1911, herein referred to.

(Signed) ——— ———.

Date ———.

Post office ———.

Express office ———.

New applicants will be supplied with not more than 200 trees, depending on the number available at the nursery. Those who have made good use of their trees may under certain conditions receive up to 500 trees. Those desiring more than this number must obtain them elsewhere, since it was not the intent of the act to have the Government furnish trees in large quantities to any one individual. The purpose of the distribution is to stimulate interest in tree planting.

A detailed report on the method of planting and the conditions under which planting was done should be made on a record card.

which will be sent to the applicant when the trees are shipped. This card, the form of which is here given, is to be mailed to the forest supervisor, Halsey, Nebr., as soon as planting has been done.

Form 492.

REPORT ON PLANTING

SPRING 19—

1. Date trees were received_____
2. Condition of trees when received_____
3. Species and number of each_____
4. If hardwoods were received, were they planted in prepared ground?_____
5. If so, how was ground prepared?_____
6. Were pines planted in furrows or unprepared ground?_____
7. Weather at time of planting_____
8. Method of planting_____
9. Date of planting_____
10. Has a fire guard been established?_____
11. Has a stock guard been built?_____
12. Remarks_____

This card should be mailed to the forest supervisor as soon after planting as possible, and in any event not later than May 1.

The agreement provides that the planter shall report annually for three years the number of trees surviving of each year's planting, and the form of card given herewith has been prepared for this purpose. This card should be filled out early in the fall, after the trees are planted, and returned to the supervisor.

Form 491 (revised).

Return card

FALL REPORT OF KINKAID PLANTING

Date of this report, _____, 19__

Number of trees living this fall from those planted			Total living from three seasons' planting
Year before last	Last year	This year	
_____	_____	_____	_____

Do you wish trees next spring?_____

Remarks _____

(Sign here) _____

(Address) _____

GENERAL INSTRUCTIONS

1. Applications for trees must be mailed to the forest supervisor, United States Forest Service, Halsey, Nebr., before February 1 of each year to receive consideration for the distribution of that year.

2. Form 492 should be mailed before May 1.

3. Form 491 should be mailed before November 1.

4. Mark the plantations of each year by setting stakes and marking them plainly "1924," etc., so that each year's planting may be identified.

5. Success in tree planting, like success in everything else, depends upon the care given to it. Do not allow the roots of the trees to become dry. Protect the trees from fire, stock, and gophers. Cultivate all hardwoods. Officers of the Forest Service will do all in their power to assist by advice and suggestions, but it must be borne in mind that constant care and attention on the part of the planter are necessary to success in tree planting, especially in the dry, sandy soils of the Kinkaid district.

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
5 CENTS PER COPY