

A HISTORY OF THE WINKLERBELT PROJECT IN KANSAS

by

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PREFACE

In recent years, the conservation of our natural resources has received increasing emphasis. Only very recently Dr. Fairfield Osborn, president of the New York Zoological Society, pointed out that the population of the world had increased, within three centuries, from 400 million to more than two billion. By the end of this century there may be three billion or more. He spoke of the vast fertile regions in some parts of the earth which have been severely injured or ruined by man. While scientists are hunting new ways to sustain life, Dr. Osborn said that "if man continues his unthinking exploitation of topsoil, forest and water, it will take more than a research chemist to insure survival."¹

Because the Plains Shelterbelt Project, later known as the Prairie States Forestry Project, was one effort to conserve our soil, this study endeavors to present a history of the project in Kansas. The early attempts, by federal and state governments, to encourage tree planting are reviewed, the need for trees on the prairie farms is stated, the purposes of the Shelterbelt Project are listed, how the work program was carried on in Kansas is outlined and the actual accomplishments of the program are presented.

There was very little material on this subject to be found

¹ Kansas City Times, September 15, 1948.

in books. The main sources of material were newspapers, periodicals, government publications and personal interviews. Not being satisfied to make this study only an "armchair" research, the writer made a trip out to St. John, Kansas in August, 1948 in order to see the shelterbelts for herself and to interview some individuals who have belts on their property. Her trip took her through parts of Saline, McPherson, Rice, Barton, Stafford and Reno Counties. From Great Bend, Kansas south to St. John there were many belts visible from the highway. Between St. John and Hutchinson, she was seldom ever out of sight of several belts.

To Mr. Glenn W. Spring, Soil Conservation District Officer, the writer is indebted for materials, pictures and the time and effort of arranging a tour of shelterbelts in Stafford County. She is deeply indebted to Mr. T. Russell Reitz, formerly State Director of the Prairie States Forestry Project, now Administrative Officer of the Production and Marketing Administration, who so generously allowed the use of materials which would have been impossible for her to have found elsewhere. Last, but certainly not least, the writer is greatly indebted to Dr. Verne S. Sweedlun of the Department of History and Government who guided her study, read the original draft and saved her from errors common to an amateur in research.

CHAPTER I. THE SHELTERBELT IS BORN

On July 11, 1934, President Franklin D. Roosevelt issued the following Executive Order:

By virtue of, and pursuant to, the authority vested in me by the emergency appropriation act, fiscal year 1935, approved June 19, 1934 (Public. No. 412, 73^d Cong.), appropriating \$625,000,000 to meet the emergency and necessity for relief in stricken agricultural areas, there is hereby allocated from the said appropriation the sum of \$15,000,000 to the Secretary of Agriculture for the planting of forest protective strips in the plains regions as a means of ameliorating drought conditions.

In carrying out this order the Secretary of Agriculture shall have authority to make all necessary expenditures in the District of Columbia and elsewhere, including but not limited to the employment of such officers, experts and employees as he may find necessary, to prescribe their authorities, duties, responsibilities and tenure, and to fix their compensation, for the procurement, or production of seed and planting stock, for planting operations, for the purchase or leasing of the lands to be planted, for technical investigations, for fencing and for rent.

The moneys herein made available shall be expended through such agencies including corporations, as the Secretary of Agriculture may designate; and, with the consent of the state, county or municipality concerned, the Secretary of Agriculture may utilize such state and local officers and employees as it may deem necessary in carrying out this order.¹

Thus was born the Plains Shelterbelt Project which had its origin in the mind of the President when, in 1932, he was wreck-bound before a denuded slope near Butte, Montana.

Planting of trees around farmsteads or as field windbreaks was not a new thing; the practice has been going on for over fifty years. The Plains Shelterbelt Project was but a new

¹ "The Establishment of a Forest Shelterbelt", Science, 80: 91, July 27, 1934.

approach to the problem, an attempt to apply scientific methods to tree growing in much the same manner as they have been applied to the growing of other agricultural crops.

Nature, unassisted by man, brought trees westward into the plains to about the 97th meridian. Dr. Bessey has advanced the theory that the sandhills were pretty well forested three or four hundred years ago.² Tree ring studies made at the North Platte, Nebraska Substation seemed to indicate that a great drought around six or seven hundred years ago resulted in great tree losses on the plains.

About two and one-half per cent of Kansas was originally in native forest mostly along streams and on bluffs in the eastern part of the state and along ravines and watercourses farther west. Much of the original timber was destroyed by the prairie fires set by the Indians. Before the coming of the horse, it was difficult for the Indians to approach their game, so in the fall of the year they would set grass fires to drive the game to the protection of the nearest timber. These fires cut down the tree life to a minimum. There is some evidence that, with the removal of the herds of buffalo and with the decrease in the use of prairie fires for hunting, tree growth began to extend its range naturally.

Before and during the Civil War, the settlers in Kansas, realizing that the natural wooded areas were being depleted for fuel, houses and railroad building, made many artificial

² Paul H. Roberts, "What Do We See?" Plains Forester, Vol. 4, No. 6. (July, 1939), p. 1.

plantings. The Kansas Pacific Railroad officials made experimental plantings at three towns along their line in the fall of 1870 and spring of 1871. These were made at different elevations between the 98th and 102^d meridians.

In the Second Report on Forestry of the Kansas State Horticultural Society (1880) information was given on species of trees adaptable to low and high lands, desirable spacings, methods of culture and effect of trees on adjacent field crops. Almost all of the eastern counties of Kansas reported successful plantings established in the years following the drought of 1860 and a few in the late 50's. In counties farther west - McPherson, Mitchell, Reno, Saline and Sedgwick - tree planting began about 1870.

The first state forestry law in Kansas was enacted in 1887. This law permitted county commissioners to make some adjustment in taxes for tree planting. However, practically no applications were made under it. In 1909 a division of forestry was created in the State Agricultural College at Manhattan and a state nursery was established at Hays.

The extension of Federal aid for tree planting, as provided for in the Plains Shelterbelt Project, was not a new departure. The attention of Congress was early called to the necessity of legislation on the subject of tree culture on the public domain of the west. Some of the western states, including Kansas, began a system of bounties for tree planting. A day was set aside on which all the people were expected to plant trees. This became a state holiday which was known as Arbor Day.

Planting groves of trees provided windbreaks for the farmstead. Lack of fuel was the principal inducement for planting trees, coupled with the belief that forests of trees caused increased rainfall and the knowledge that wooded countries retained moisture longer than treeless plains. Government aid was asked, agricultural and horticultural societies were petitioned, state legislatures took action and timber culture became a much discussed subject in the west.

In 1836, the Commissioner of General Land Office, Joseph S. Wilson, petitioned Congress to afforest the plains in part. His message to Congress read:

If one-third the surface of the Great Plains were covered with forest, there is every reason to believe the climate would be greatly improved, the value of the whole area as a grazing country wonderfully enhanced, the greater portion of the soil would be susceptible of a high degree of cultivation.⁵

The first Timber Culture Act passed by Congress was on March 3, 1873. It provided for planting 40 acres in trees on a timber culture entry of 1/4 section, with trees not more than 12 feet apart each way. It was a timber bounty act with the additional clause that land in cultivation for timber was not liable for debts contracted prior to the issuing of the patent therefor. Not more than 160 nor less than 40 acres could be entered under this law. The act was amended in 1874 to permit entry of smaller tracts and requiring that 1/4 of the acreage be planted to trees. The law was again amended in 1876, still

⁵ Lake States Experiment Station, Possibilities of Shelterbelt Planting in the Plains Region (Washington: U. S. Government Printing Office, 1935), p. 51.

retaining the 12-foot spacing, but permitting planting of trees in four separate tracts and requiring replanting of any trees which did not grow or were destroyed. In 1878 another amendment included the requirement that not less than 2700 trees per acre be planted with four by four spacing. Final certificates of ownership would be issued on showing of 675 living and thrifty trees to each acre. Most of the timber-entry planting was done under the 1878 provisions as the larger settlement booms occurred in the late seventies and early eighties.

There were many oases of insincere and even fraudulent attempts at growing trees with the idea of getting title to free land. In Kansas, from March 3, 1873 to June 30, 1883, there were 23,942 original entries made while there were only 256 final entries.⁴ The Timber Culture Act was repealed in 1891. While the act was not generally successful, it did help to direct the popular thought to tree planting on the plains. There were some successful plantings made and where these were on favorable sites and protected from fire and livestock, they have not only lived but tended to perpetuate themselves. Mr. L. D. Burch writing in 1878, has this to say about tree planting under the Timber Culture Act:

In the homestead counties where the government has stimulated artificial forestry by the "Timber Act", giving any man, or head of family, 160 acres of land on condition of his or her planting 40 acres of the same in timber and caring for it seven years, beautiful groves of cottonwood, ash, boxelder, maple and walnut dot the

⁴ Thomas Donaldson, The Public Domain (Washington: U. S. Government Printing Office, 1884), p. 1290.

country in every direction and lend a charm to the prairie landscape quite beyond my power of description. These charming groves will be as numerous and noteworthy, in the near future of Kansas, as the orchards of Michigan and western New York. Columns of forest trees outline the farms and highways for miles and miles, in many districts, and it is no unusual thing for a farmer to plant 10,000 young trees in a single year. With the pretty valley timber belts and artificial groves grown into stateliness, ten years from today Kansas will be one grand continuous park and the most beautiful country under the sun.⁵

The Federal government has made other provisions for the encouragement of tree planting on the plains. The Nebraska National Forest was established by proclamation on April 16, 1902 by President Theodore Roosevelt. This was a large demonstration of sand-hill planting of conifers. Some 302,387 acres in Kansas was proclaimed a national forest but for various reasons was discontinued as a national forest project in 1915.⁶

Congress, in the 1913 appropriations for the Department of Agriculture, included permission for the establishment of the Northern Great Plains Field Station at Mandan, North Dakota. Part of the work of the station was to grow, distribute and experiment with trees suitable to the plains region. Since 1916 there were nearly 6,000,000 trees supplied to the farms of that area.⁷

A milestone in American forestry legislation was the Clarke-McNary Act of June 7, 1924. This act provided for Federal and

⁵ L. D. Burch, Kansas As It Is (Chicago: C. S. Burch and Company, 1878), p. 27-28.

⁶ Lake States Experiment Station, op. cit., p. 52.

⁷ Idem.

State cooperation with the landowners in (1) protecting forest lands from fire, (2) devising of tax laws designed to encourage forest conservation, (3) procuring and distributing forest-tree seed and planting stock, (4) establishing and renewing of shelterbelts, wood lots and other forms of forest growth, and (5) developing and improving timber denuded forest lands through control by the Federal government. Section four covered the distribution of seed and planting stock and had a marked effect on the planting of wood lots and shelterbelts.

The high wheat prices following World War I caused numbers of farmers to plow up many acres of virgin prairie and cut out hedge rows in order to raise more wheat. There were some good crops but with the coming of the drouth of 1933-1934, and with no protective cover of grass to hold the soil, the wind sweeping across the plains started the wind erosion problem. The seriousness of the problem was brought to the attention of everyone by the dust storms or "black blizzards" as they were called.

Students of the situation tell us that we cannot get along with less than 300 million acres of productive land. We are now using 400 million acres of land but at the present rate of deterioration we shall have in 50 years, only 150 million acres of productive land left.⁸ Our only salvation, economically, is to conserve our land.

⁸ "Land is Life", Plains Forester, Vol. 2, No. 2 (February, 1937), p. 1.

For several years the Forest Service together with other research agencies had considered the possibility of planting field shelterbelts on the farms of the plains region as an aid in controlling wind erosion, stabilizing crop production and furnishing wood products. The basic purposes behind the project had been dormant for some time awaiting an opportune time for their initiation. The drouth of 1933-1934, followed by the disastrous dust storms furnished the impetus to give form to the Plains Shelterbelt Project.

CHAPTER II. DELIVERED TO A BEWILDERED PUBLIC

The announcement of the birth of the Shelterbelt Project was hailed with a barrage of publicity some of which was unfortunate; unfortunate because some of the statements of foresters were misquoted or exaggerated to make a good newspaper story. The general public got the idea that trees were to be planted in solid north and south belts about a mile apart over a hundred-mile-wide strip through the plains all the way from the Canadian border to the Texas Panhandle, regardless of topography, kind of soil or climatic conditions.

The project caused an uproar among some of the foresters, botanists, ecologists and other scientists. The president of the Society of American Foresters, in an editorial in the Journal of Forestry, expressed the view that trees could be grown on the plains if all precautions were taken. But, he questioned the advisability of spending so much money and stated that foresters felt that the money could be spent for more substantial conservation projects.¹

The idea of planting trees in the Plains region was damned by some scientists in no uncertain terms. Such statements as the following were made: "The plan is fantastically impossible."

¹ H. H. Chapman, "The Shelterbelt Tree Planting Project," Journal of Forestry, 32: 801-803, November, 1934.

"I can only regard the tree planting project as an air-castle of a dreamer."

"The only new thing in the present project is the naive assumption that elemental forces can be controlled over an area of 100,000 square miles at a cost of less than astronomical proportions."²

"Farther east such a belt would have a better chance, but in the area where it is proposed, I can see no chance for anything but failure for the project."³

On the other hand there were those who not only believed that the trees would grow, if properly planted and cared for, but that they would exert a definite influence on the climate of the immediate region. Those who favored the project had evidence to support their belief that the shelterbelts would affect wind velocity, evaporation and temperature thus helping to conserve moisture, reduce wind erosion and prevent dust storms.

Such statements as the following indicated that not all of the foresters thought that this emergency-born child, the shelterbelt, was doomed to an untimely death:

In answer to your question as to the technical soundness of this large federal project, I would unquestionably state that it is entirely sound and with the proper species of trees and previous preparation followed by subsequent cultivation and supervision should give a high degree of success.⁴

² John D. Guthrie, "Trees, People & Foresters," Journal of Forestry, 40: 477, June, 1942.

³ H. H. Chapman, "Digest of Opinions Received on the Shelterbelt Project," Journal of Forestry, 32: 962, December, 1934.

⁴ Chapman: op. cit., p. 958.

It is our judgment that the project has some merit if modified to meet local conditions and if plantings are made under favorable conditions first.⁵

The project was officially christened "The Plains Shelterbelt Project" and laid in the lap of the Forest Service of the United States Department of Agriculture to nurture. A comprehensive study of the Plains States was necessary to work out the details of caring for the project. The climate, soils, vegetation, land use and kinds of trees that had grown successfully were all taken into account. The research data, which had been assembled over a period of years by the agricultural experiment stations, were thoroughly studied.

With all this information at hand the boundaries of the shelterbelt zone were rather definitely fixed. The species of trees to be planted were selected and the techniques of procedure were established. The zone which was 100 miles wide and approximately 1150 miles long was confined to the transition zone between the tall-grass prairie and the short-grass plains. It lay roughly between the 98th and 100th meridians through the Dakotas, Nebraska, Kansas, Oklahoma and into the Texas Panhandle.⁶

The allotment of \$15,000,000 set by the President was later reduced to \$1,000,000. With this money, Regional Headquarters were established in Lincoln, Nebraska in the winter of 1934. The officers in the Regional Headquarters were the Director, Associate Director, Chief of Operation, Chief of Public Rela-

⁵ *Ibid.*, p. 957.

⁶ FIG. 1. The boundaries of the zone in Kansas.

tions, Chief of Planting & Nurseries, Chief of Lands, and Offices of Fiscal Control, Law, Engineering and Maintenance and Purchases.

About January of 1935 the state offices were set up in each of the six states. The personnel of the state offices consisted of a State Director, one or more Unit Directors, one or more Associate Foresters, three or more Shelterbelt Assistants, one or more nurserymen, an Executive Assistant and Senior Clerk, stenographic and clerical assistance, and field foreman and laborers in accordance with requirements of the work.

The Forest Service placed a few experienced men from their organization in key positions in the Regional and State offices. However, all of the State Directors, except in Texas, were men selected from their own states.

What was this strange new child, this Plains Shelterbelt Project, and for what purpose had it been conceived in the minds of the President and the Forest Service?

A shelterbelt is a windbreak of trees and shrubs intended to protect a field, a farmstead, a feedlot or any area which needs to be protected from the wind.

The primary purpose of the shelterbelts in the plains region was to protect the soil from wind erosion and the crops from being blown out of the ground. The level topography of the Great Plains region made it subject to high and fairly constant wind movements. These winds tended to erode unprotected soil.

carrying the lighter, richer soil many miles and leaving the coarser and less fertile particles to blow along the surface of the ground or pile up in dunes. In the spring of 1937, soil-conservation men collected some soil material which had been deposited in Iowa by a dust storm which originated in the Oklahoma and Texas Panhandles. They also obtained samples from a sand dune which was formed by the same storm near its origin. The sample from Iowa - 500 miles away - contained 10 times as much organic matter and was richer in plant food than the samples from the sand dune.⁷ The shelterbelt was designed to lift and slow down these surface winds. The velocity of the wind has been reduced as much as 35 per cent in the summer and about 20 per cent in the winter by strips which were planted 600 feet apart in test areas.⁸

It was found that the belts were more effective if the taller growing trees were planted in the middle of the strip, with the shorter trees and shrubs on the outside so that the belt presented a sloping surface to the prevailing wind.⁹ When the length of the belt was doubled, the area protected was three times as large. The effective zone of influence of a shelterbelt reaches to 20 times its height on the leeward side. The belt also has some influence on the windward side.¹⁰

⁷ "Dust Storm Sifts Out Rich Soil Leaving Sand Behind," Plains Forester, Vol. 2, No. 12 (December, 1937), p. 10.

⁸ "Planting a Shelterbelt Through Middle of America," Literary Digest, 118: 15, August 11, 1934.

⁹ Figs. 1 and 2, Plate I.

¹⁰ Ross A. Williams, "Forestry", Report of the Kansas State Board of Agriculture, 65: 117-125, 1946.

EXPLANATION OF PLATE I

- Fig. 1. A belt planted on the south side of a field.
The shorter trees are on the side toward
the prevailing wind.
- Fig. 2. An end view of a 1935 belt showing its contour.

PLATE I



Fig. 1.



Fig. 2.

There has been some discussion as to whether tree growth influences rainfall but there is no scientific evidence to prove that trees do increase rainfall. However, shelterbelts have a comparable effect for they do help to conserve moisture by slowing down evaporation and by catching the snow on the ground instead of allowing it to drift into gullies. In a study conducted between 1935 and 1937, J. H. Stoeckeler and E. J. Dortignac found that shelterbelts with one or more dense shrub rows, at least eight feet high, were very effective in catching snow in drifts which were five to eight feet or more deep. Most of the snow was stopped in an area of 30 to 80 feet wide on the lee side of the first row of shrubs which the wind met. Narrow belts of taller trees with no limbs near the ground allowed the snow to sweep through the belt and deposit in a sheet about one to two feet in depth on the lee side in a zone reaching 600 to 1200 feet beyond the belt. Where the shelterbelts were so designed as to cause deep snowdrifts in the belt, the increase of moisture was equal to 10 inches of water. The crop areas within 80 feet of the belt had an increase of five inches of water due to the lateral movement of the moisture from the melting snowdrifts.¹¹

Trees planted around a farmstead give protection to livestock, save fuel and make possible the raising of fruits and vegetables that might not otherwise grow. These wind-

¹¹ J. H. Stoeckeler and E. J. Dortignac, "Snowdrifts as a Factor in Growth and Longevity of Shelterbelts in the Great Plains", Ecology, 22: 117-124, April, 1941.

breaks reduce losses in livestock due to exposure and cut down the feed requirements during the winter. Experiment station feeding tests have shown that windbreaks are more effective than sheds in reducing feed requirements.¹² The noted geographer, J. Russell Smith, said that the honeylocust tree, which was one species used in the plantings, is a legume which improves the soil. He declared that the beans are good stock feed and that some farmers were picking and grinding the beans to feed to dairy cows. According to chemical analysis, the beans yielded more than 30 per cent of their weight in sugar.¹³

The windbreaks protect farm buildings and equipment and save fuel. It has been found that trees protecting the north side of a farmstead reduce the fuel requirements 25 per cent. If the plantings are on both the north and the west, the saving is 34 per cent. A 43 per cent reduction in fuel is obtained by having plantings of trees on all sides of the farmstead.

Another purpose of planting trees in the plains region was to provide a supply of wood products in the form of fuel, fence posts, and rough lumber needed on the farms. Trees and shrubs also furnish food and cover for wildlife, particularly

¹² "The Prairie States Forestry Project - What It Is and What It Does", United States Department of Agriculture, Forest Service, p. 9.

¹³ R. A. Dellberg, "Honeylocust May Come Into Its Own", Plains Forester, Vol. 4, No. 8 (October-November, 1939), p. 8.

insectivorous birds. These birds are of real value in destroying insects which would harm the crops. Game birds, such as pheasants, have been attracted to the belts. In Stafford County, Kansas, open season was declared on pheasants last year for the first time.¹⁴

Any consideration of the purposes of the Plains Shelterbelt Project would not be complete without mentioning the fact that trees make a better place in which to live. The early settlers realized that fact and many who came from the more wooded areas of the East planted trees around their homes in the West because they knew that trees improved the appearance of their farms. In its report of 1880 the Kansas Horticultural Society said, "Those settlers who planted shelterbelts and groves are fixtures on their farms, while those who never planted trees have pulled up stakes and gone elsewhere."¹⁵

The foresters assigned to the nurture of the shelterbelt were not only to plant trees to reduce wind erosion, but to incorporate all of the multiple purposes of trees. That was one reason why they adhered rather firmly to the policy of planting a standard basic belt of 10 rows of trees. They felt that, when all of the purposes were combined, the farmer needed more than the minimum number of rows necessary for wind protection. For wood products he needed extra rows that could be cut in later years without destroying the effectiveness of his shelterbelt. For esthetic value he needed a variety of

¹⁴ Personal interview, Mr. Blaine O'Connor, St. John, Kansas, August 25, 1948.

¹⁵ Plains Forester, Vol. 2, No. 2 (February, 1937), p. 5.

species to give a pleasing appearance. There should be variety to provide fruit and nuts which were very scarce in the plains region. When most of these purposes were combined in a belt there was economy of land use, of cost per established tree, and of the farmer's time in maintaining such a combination planting as compared to several plantings designed for each of the purposes.

Being aware that this infant-project had dazed the public and had been received with skepticism in some quarters, the Forest Service did not want to take any unnecessary chances in its development. The Forest Service men knew that anyone could plant trees but that they must take into account association of species, selection of species for the various sites, and permanence of the trees. Although some farmers objected to giving up enough land for a 10 row belt, the foresters thought it better to find, in future years, that they had planted more trees than necessary rather than too few to be effective. There were real reasons why several different species were used in each belt. First, rows of taller, fast growing trees were needed to erect a wind barrier as quickly as possible in order to protect adjoining fields. These faster growing trees were flanked with slower growing species and on the outside were the low shrubs so that, when the belt reached maturity, its crown would be roof-shaped. Second, the use of several species afforded insurance against the whole belt being wiped out by some disease or insect

epidemic which might attack one kind of trees. Third, the use of trees with different life spans made possible the indefinite perpetuation of the planting.¹⁶

On smaller farms, where the 10-row basic shelterbelt took too large a percentage of the land, the number of rows was reduced so that the belt would not occupy more than five per cent of the land in the farm.

Not all of the farmers in the plains region accepted the government's tree deal. Some reasons given were (1) that the land was too valuable for other purposes, (2) the cost of fencing the shelterbelt, (3) the farm was in process of foreclosure, (4) lack of information and (5) "Roosevelt - wasn't it his idea?"¹⁷

Notwithstanding the fact that the Plains Shelterbelt Project was born of an emergency, received somewhat skeptically by the public, and doomed, by some scientists to an untimely end, it survived and grew so that millions of trees were planted and thrived in the plains region of the west.

¹⁶ See diagrams on Page 22.

¹⁷ "The Shelterbelt Comes True", Business Week, 1940, Part 2: 20, April 6, 1940.

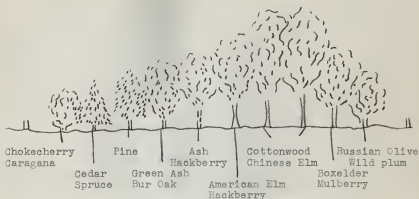


Fig. 1. Typical 10-row composition in the northern states.
 Spacing: shrubs 8' or 10' x 3'
 trees 8' or 10' x 6' or 8'

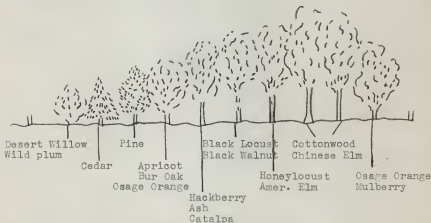


Fig. 2. Typical 10-row composition in the southern states.
 Spacing: shrubs 8' or 10' x 3'
 trees 8' or 10' x 6' or 8'

Source: "The Prairie States Forestry Project - What It Is and What It Does", United States Department of Agriculture, Forest Service, p. 6.

CHAPTER III. SURVIVAL AND GROWTH ON A LEAN DIET

According to a report issued by the United States Department of Agriculture on June 1, 1942, there had been a total of 217,378,352 trees planted in basic and intermediate shelterbelts on 30,223 farms in the six states through which the Shelterbelt Zone extended. There were other types of plantings such as highway, feedlot, farmstead, schoolground, and garden which brought the grand total to 222,825,220 trees on 33,185 farms.¹

One might say, "Yes, all of these trees were planted at great expense to the government; but, how many lived?" On another page of the same report there was given the average survival percentages "based on actual count of approximately 10 per cent of all belts, mechanically selected". These were as follows:

1935 - 68.3 per cent	1939 - 65.7 per cent
1936 - 51.2 per cent	1940 - 78.8 per cent
1937 - 70.1 per cent	1941 - 82.3 per cent ²
1938 - 61.0 per cent	

From these facts, it becomes evident that, although the Plains Shelterbelt Project was received by a bewildered and somewhat skeptical public, it did survive and grow. This survival and growth is the more remarkable when it is under-

¹ "1942 Annual Planting Accomplishment Report", United States Department of Agriculture, Forest Service, June 1, 1942. Table 1.

² Ibid., Table 14.

stood that the project was not only emergency - born but also had to exist on emergency rations.

In this chapter the development - on emergency appropriations - of the Shelterbelt Project in Kansas will be traced. Mr. Charles A. Scott of Manhattan was the first State Director. He was succeeded by Mr. T. Russell Reitz, who served as Director as long as the project was in operation.

Negotiations with farmers, who were interested in having a shelterbelt on their property, were started in January of 1935. The first agreements provided that the government would pay a cash rental for the land devoted to a shelterbelt, reimburse the farmer for his expense of preparing the land for planting, furnish the fence material and compensate the farmer for cultivating the belt. The contribution of the farmers to the project was very small during the first year.

Every tree of suitable size for shelterbelt planting that could be procured from commercial nurseries in Kansas and Colorado was purchased. Cottonwood wildings were obtained from along the Kansas River. A total of 264,000 trees was planted, during the spring of 1935, in Pratt, Stafford, Edwards, Comanche, Kiowa and Pawnee Counties. Although the weather conditions were adverse during the planting season, 50 per cent of the trees survived the summer. Seedlings which measured 15 to 18 inches in height when they were planted were trees five to eight feet in height by June of 1936.³

³ Charles A. Scott, "Progress Report of the Shelterbelt Project in Kansas", United States Department of Agriculture, Forest Service (June 30, 1935), p. 1.

In the spring of 1935 the government leased land and facilities from four commercial nurseries. These nurseries were located at Manhattan, Abilene, Salina and McPherson. It was not possible for the government to make contracts with commercial nurseries for the growing of stock because the government's fiscal year ends on June 30, which is in the middle of the growing season. Since government agencies cannot contract for anything which cannot be delivered before the end of the fiscal year, and may not pay in advance, the commercial nurserymen did not want to take the risk of growing the stock and hoping that there would be an appropriation of money to buy the trees. Another reason for government production of planting stock was that the money for the project came from the Emergency Relief Appropriations. Most of the money was needed for the employment of relief labor and this left only a small amount for the purchase of supplies. It seemed desirable, therefore, to lease the nurseries and use relief labor in their operation.

During the year, 775 relief roll laborers were employed on the project. When the actual planting began in March, the men reported at seven-thirty o'clock in the morning and spent eight hours in the field. They were supplied with the necessary equipment. The trees were hauled in trucks from the nursery packing house to the planting sites. The ground had been listed and subsoiled ready for the planting to be done. At the beginning of the season the men planted at the rate of

400 trees per man per day and later were able to increase this to 600 trees. The cost to the government of all trees planted during the first year was \$0.062 per tree.⁴

Although this was a small cost per tree, the expense of the entire project was so great that, at the beginning of the fiscal year, July 1, 1935, it was realized that some changes would be necessary to relieve the government of extra expenses. It was arranged that payments to farmers for tree planting would come from the Agricultural Adjustment Administration. The negotiations with farmers were made on this basis. But, some of the provisions of the AAA Farm Program were outlawed by the Supreme Court in January, so that it became necessary to change the agreements with the farmers. To make it possible for the Forest Service to continue the project through the year 1936, the President approved \$1,814,083 from funds which were provided under the Emergency Relief Appropriations Act of 1935.⁵

Because of the necessity for economy, the Forest Service asked the farmers to furnish the fence materials and prepare the land for planting. Relief labor was used to build the fences and to plant and cultivate the trees. Relief labor was also used to produce the stock in the government-leased nurseries. In spite of dry weather and grasshoppers, unstable financing and changed agreements with the farmers, the Forest

⁴ Ibid., p. 1-2.

⁵ WPA Report on Progress of the Works Program (July 15, 1936), p. 41.

Service planted, in the spring of 1936, 3,287,000 trees in 215.25 miles of shelterbelts on 367 farms in Kansas.⁶

In 1936, Congress was presented with an estimated budget for continuing the project. Congress refused to recognize the legitimacy of the project and appropriated \$170,000 for its liquidation.⁷ Some of the project personnel were transferred to other departments. However, the project was saved from death by the Works Progress Administration which saw in it a place to use relief laborers and decided to furnish the necessary money from the relief funds. The project was re-christened the "Prairie States Forestry Project."

Some of the technicians were called back to go ahead with the work of the Prairie States Forestry Project but the organization was somewhat simplified. New agreements were made with the farmers. Under this agreement the farmers were to (1) prepare the land for planting, (2) supply the fence materials, (3) do the cultivating, and (4) carry on rodent and insect control measures. The width of the belts was reduced from 10 rods with 12 to 17 rows of trees, to an optional five or seven rod width, with seven to ten rows of trees. Fifteen counties were now included in the program as it was quite generally thought that the project would end with the 1937 planting. Because of this belief, trees were made

⁶ "1942 Annual Planting Accomplishment Report", *op. cit.*, Table 1.

⁷ U. S. Statutes at Large, Vol. 49, Part I Public Laws. (Washington: U. S. Government Printing Office, 1936), p. 1439.

available to as many farmers as possible.

The project was again saved, but this time by Congress, in its enactment of the "Cooperative Farm Forestry Act" on May 18, 1937.⁸ At last, after nearly three years, the legitimacy of this emergency-born project was recognized by legislative sanction. In expectation of more stable financing for the project, the 1938 plantings were extended to more farms and counties. There were 4,156,472 trees planted in 696.50 miles of new shelterbelts on 952 farms in 20 counties.⁹

It was in the summer of 1937, while planning the planting program for 1938, that the Township Tree Committee idea originated. The Forest Service had trees enough to plant about four times as many as any previous year but they were faced with the problem of getting the farmers to sign up for the belts. Also, it was thought advisable to have some definite pattern for the shelterbelts in each community so that the maximum benefit might be realized. Lacking such a pattern, the belts would be planted in the wrong places. A farmer might receive benefits from the shelterbelts of his neighbors and yet not have contributed any land for the belts. Realizing that a community planting plan was needed, the question was, "Who will make the plan?" If the Forest Service men made the plans the farmers would feel that it was the government's program instead of their own. Consequently, it was decided that the farmers should sponsor these community planting plans.

⁸ *Ibid.*, Vol. 50, Part I, p. 199.

⁹ "1942 Annual Planting Accomplishment Report", *op. cit.*, Tables 1 and 7.

Accordingly, the first Township Tree Committees were appointed in Stafford and Edwards Counties in September, 1937. The Forest Service made the appointments assisted by the County Agricultural Agent. By the end of 1938 there were about 140 of these committees.

With a map of the township before them, the Township Tree Committee and the district officer laid out an ideal pattern of shelterbelts on paper. Then the members of the committee went to work, either directly or indirectly, on the land-owners to get them to cooperate in the plan for the township. Much of the success of this plan depended upon the district officer's ability to pick good leaders and to explain to them and to the people that they would receive the greatest benefits, only, when everyone planted his share of trees.

As a result of the work of these committees in securing community cooperation, the interest shown by Farm Bureaus and other agricultural organizations, the assistance of county commissioners, the wide publicity given the program and other factors, the spring of 1939 saw the largest planting in the history of the project in Kansas. There were 6,493,540 trees planted on 1286 farms in 34 counties. The survival rate was 68.8 per cent.¹⁰

Because the program was still being financed through the Relief Appropriation Act it was necessary to ask the farmers to give more assistance. They were expected to furnish

¹⁰ Ibid., Tables 1, 7 and 14.

tractor power to pull the special machine which did the subsoiling and the marking of the tree rows which made the planting easier and faster.

To make the work of planting millions of trees easy and fast, every detail was worked out by the Forest Service personnel. During the fall preceding the planting season, the "land negotiations" work was carried on. This phase of the plan consisted in convincing the farmer that he wanted the trees badly enough to relinquish the land for them and to meet the requirements of the agreement. Everything possible was done to arouse community interest. Community meetings were held and the cooperation of farm organizations was sought. The influence of key men, such as the Township Tree Committees, was used to bring the farmer to the Forest Service to ask for a shelterbelt on his farm. The application for a belt could be made verbally or in writing. The third step of the plan was the examination of the land by the "land examiner." Some general considerations which helped the "examiner" determine the advisability of planting the belt, were (1) whether the land was good or submarginal, (2) the need for a shelterbelt, (3) the possibilities of the successful establishment of trees, (4) the type of operator, whether landlord or tenant, and (5) if the land was held by insurance companies or other agencies.

Not only was the land examined, but the farmer was "examined" also. The Forestry men knew that the trees planted would

EXPLANATION OF PLATE II

Fig. 1. Half of this belt was planted on one farmer's land and the other half on a farm belonging to another cooperator. At the end of one season the difference made by good cultivation can readily be seen.

PLATE II



FIG. 1.

Courtesy of Mr. Glenn Spring, St. John, Kansas.

EXPLANATION OF PLATE III

Fig. 1. Cultivating weeds out of tree row by means of two grape hoes pulled behind a tractor. By having the men ride on sleds the tractor could go much faster.

Fig. 2. A planting crew in operation.

PLATE III



Fig. 1.



Fig. 2.

Courtesy of Mr. Glenn Spring, St. John, Kansas.

need good care if they were to survive.¹¹ This "examination" of the farmers helped to eliminate those who were not interested enough to take proper care of the trees by careful cultivation during the first few years.¹² This was an extremely important point for "adequate cultivation was the most important single factor in determining success or failure of tree planting in the Plains."¹³

The next step in the plan was the preparation of the ground. The farmer was required to have his ground in a condition acceptable to the standards of the Forest Service. The men of the Forest Service endeavored to select good planting stock and to insist on careful handling to prevent damage. The seedlings were tied in bundles, loaded and hauled in trucks with careful precautions against their drying out. The seedlings were unloaded and placed in heel-in beds until they were sent to the planting site. The rows were marked by a chain or by the special subsoiling machine before the men began to plant. Each planting crew had a foreman and a tree tender. The latter distributed the seedlings from the tree boxes in the trucks to the planters. There was one planter for each row of trees to be planted.¹⁴ He carried a tree-tray containing a little water. The tray was covered with wet

11 Fig. 1, Plate II.
 12 Fig. 1, Plate III.
 13 E. W. Munns and Joseph H. Stoeckeler, "How Are the Great Plains Shelterbelts?" Journal of Forestry, 44: 249, April, 1946.
 14 Fig. 2, Plate III.

burlap to protect the trees from drying out.

The actual technique of planting was worked out so carefully that if a man followed it exactly, he could easily plant a tree a minute. Some men far exceeded that speed, planting as many as 1,000 or more trees in a day.¹⁵

The steps in the planting technique as given in the Handbook of Division of Timber Management were as follows:

1. Remove loose dry soil from surface where tree is to be planted.
2. With shovel reversed, sink it to full depth of blade.
3. Push handle forward to break out soil behind shovel blade.
4. Loose soil pulled back and up and deposited directly back of hole.
5. Straighten back wall of hole by making a second cut.
6. Holding soil out of hole with shovel, remove tree from tray.
7. Insert tree in hole at proper depth with roots well spread.
8. Fill hole half full and tamp with heel.
9. Completely fill hole and tamp with heel.
10. Tamp soil ahead of tree.
11. Kick dust mulch over tamped surface.
12. Pick up tray and step off distance for next tree.¹⁶

¹⁵ Karl P. Ziegler, "We Believe He's the Project's Champion", Plains Forester, Vol. 4, No. 4 (May, 1939), p. 2.

¹⁶ "Handbook of the Division of Timber Management", United States Department of Agriculture, Forest Service, p. 18-19.

Working out the details and techniques of the actual planting was not the only concern of the Forest Service. It was interested in awakening the public to the desirability of planting trees. To do this, it sought the cooperation of newspapers and various organizations. In Meade County the newspapers gave front page space to the project. The chambers of commerce donated the time of several members for land negotiations work and one rural mail carrier delivered application forms to each home along his route. Between October 23 and November 12, 1939 the Hutchinson News-Herald published 40 items concerning the project. Many other papers devoted space to news stories about the Prairie State Forestry Project.

Affording unusual opportunity for publicity about the project, were Mrs. Eleanor Roosevelt's inspection tour in 1939, and the annual picnic held in 1940, 1941 and 1942. The first Shelterbelt Picnic was held at the home of Mrs. Mamie Faye near Pratt, Kansas on August 29, 1940. In 1935, Mrs. Faye had been induced to have a shelterbelt, the first in Kansas, planted on her farm. She was not very enthusiastic about the idea at the time, as it seemed a bit far-fetched to plant trees where nature had ordained grass to grow. As the years passed, she lost her doubts about the possibility of establishing trees in the plains and became an ardent worker for the project. She thought that more people should hear about the program and so she decided to have a picnic in her first shelterbelt. Some 1200 people from 20 counties gathered in her shelterbelt,

where lunch was served from a quarter-mile table in the shade of the growing trees. The Pratt Daily Tribune put out a special edition devoted to publicity about the picnic and the Shelterbelt Project. Other papers of Kansas gave the picnic considerable publicity and some distant editors, intrigued by the quarter-mile table, also gave some space to the affair.¹⁷

The second annual picnic on August 21, 1941 in the Clark shelterbelt located west of Great Bend, Kansas was the scene of the organization of the Kansas State Shelterbelt Association, the first organization of its kind in the world. The idea for this association originated with Mrs. Faye. She had been thinking of ways and means in which the shelterbelt cooperators in the state might unite to promote the work of the Prairie States Forestry Project and other forestry activities. Other people became interested and the organization was effected in about one hour's time during the picnic. The purposes of the organization were (1) to provide a means of association for the tree lovers of Kansas, and a place for the expression of their ideas on the subject, (2) to give encouragement to all worthwhile tree planting programs in the state, and (3) to furnish information on forestry to the members, to schools and to other organizations which were interested.

Due largely to the work of the Prairie States Forestry

¹⁷ E. L. Perry, "Kansas Has Shelterbelt Picnic, Too", Plains Forester, Vol. 5, No. 9 (September, 1940), p. 6.

Project, Arbor Day celebration was revived in Kansas. In 1940, the Junior Chamber of Commerce at Great Bend, Kansas put on a countywide drive to get trees planted on Arbor Day. They took orders for seedlings at cost, purchased the seedlings in bulk from commercial nurserymen, bundled them by orders and delivered them to several distribution points. They succeeded in getting 35,000 trees planted. In 1941, the Kansas Junior Chamber of Commerce, adopting the slogan "A Million Trees for Kansas", sponsored a program for the planting of a million trees in 30 counties on March 29. In commenting on these plans, the chairman of the Arbor Day program said in part, "It seems selfish not to do our part in planting the trees. Somebody set them out for us 50 years ago under considerably more adverse circumstances. We ought to do it for the future because our grandparents did it for us."¹⁸

Not only were civic organizations interested in encouraging tree planting but the Kansas Legislature passed the "Shelterbelt Snow Fence Law" in its 1941 session. This act was "to encourage the planting of shelterbelts of trees and shrubs on privately owned lands outside cities and adjacent to public highways for purpose of providing windbreaks and protection to soils, crops, livestock and wild life, and authorizing reductions in assessed valuations of such lands." Under the provisions of the act, if a shelterbelt was planted

¹⁸ John D. Hall, "A Million Trees for Kansas", Plains Forester, Vol. 6, No. 3 (March, 1941), p. 2.

according to the specifications of the act, the owner was entitled to a reduction of 80 per cent in assessed valuation of the acreage on which the shelterbelt was situated. This reduction in assessed valuation was to continue as long as the trees provided adequate protection to the public road. The decision as to the effectiveness of the belt was left to the county commissioners.¹⁹

The work of the Prairie States Forestry Project continued through 1940, 1941 and the spring of 1942.²⁰ On July 1, 1942 the project was transferred from the Forest Service to the Soil Conservation Service. There was a limited appropriation for the purpose of absorbing the shelterbelt activity into the regular soil conservation district program. At the time of the transfer there were only 16 soil conservation districts in Kansas. Consequently, it was rather difficult to supervise the work of the Prairie States Forestry Project in those counties which were not organized in districts. However, during the spring of 1943 well over a million trees were distributed in the unorganized counties. There was no complete record of the number of trees actually planted in 1943.

On August 27, 1942, the third annual Shelterbelt Picnic was held at the Herman Witt farm near St. John, Kansas. At this time the Kansas Shelterbelt Association changed its name to Kansas Shelterbelt and Conservation Association.

The county agents in several of the counties encouraged

¹⁹ Laws of Kansas, 1941. (Topeka: Kansas State Printing Office, 1941), p. 9-11.

²⁰ Table 1, page 42.

the farmers to continue the care of their shelterbelts. Later, more counties were organized into soil conservation districts and continued planting trees under the soil conservation farm plans.

Table 1. Record of planting by counties.

County	1936:	1936:	1937:	1938 :	1939 :	1940 :	1941 :	1942 :	Total
	Miles								
Barber	-	9.25	.50	4.87	53.50	51.75	18.88	12.63	149.38
Barton	-	16.50	1.87	28.50	51.50	19.88	13.50	5.62	137.37
Butler	-	-	-	-	-	12.50	28.82	15.63	56.75
Brown	-	-	-	-	4.88	-	1.00	-	5.88
Clark	-	16.50	14.63	12.12	7.25	17.50	5.12	4.00	77.12
Clay	-	-	-	-	-	2.63	3.25	1.87	7.75
Cloud	-	-	-	-	-	6.25	19.75	13.12	39.12
Comanche	1.00	35.25	15.38	11.12	10.50	12.25	15.12	8.63	107.25
Cowley	-	-	-	-	-	5.75	9.82	4.12	19.49
Dickinson	-	-	-	-	1.00	14.50	8.63	9.38	33.51
Douglas	-	-	-	-	-	-	.37	-	.37
Edwards	2.50	11.25	14.25	82.13	22.75	9.12	15.88	7.75	145.63
Ellis	-	-	-	-	-	2.25	1.38	2.50	6.13
Ellsworth	-	-	-	-	-	6.00	10.75	6.50	23.25
Finney	-	-	-	-	1.00	-	-	.62	1.62
Ford	-	3.25	1.50	51.50	28.00	1.00	3.87	17.88	107.00
Graham	-	-	-	-	-	-	-	1.25	1.25
Gray	-	-	-	-	14.12	1.00	1.75	7.12	23.99
Harper	-	12.75	30.00	23.75	38.25	28.25	14.63	22.38	170.00
Harvey	-	-	-	1.50	21.50	19.38	21.50	14.00	77.88
Hodgeman	-	2.50	.50	-	1.00	.62	.50	-	5.12
Jackson	-	-	-	28.50	3.87	.25	4.63	-	35.25
Jerrell	-	-	-	-	-	2.50	6.75	6.25	15.50
Kearny	-	-	-	-	.50	-	-	-	.50
Kingsman	-	2.00	1.00	130.87	69.00	47.25	38.13	35.13	323.38
Kiowa	2.87	16.50	9.75	9.00	13.75	20.25	19.50	7.50	99.37
Lincoln	-	-	-	-	-	11.38	11.25	3.63	26.25
McPherson	-	-	-	.50	1.63	10.00	9.12	9.87	31.12
Marion	-	-	-	-	-	2.37	8.00	1.50	11.87
Meade	-	-	-	-	40.88	8.75	6.12	.88	56.63
Mitchell	-	-	-	-	10.38	20.00	8.50	8.87	47.75
Morris	-	-	-	-	-	-	2.00	-	2.00
Ness	-	-	-	-	1.75	.88	1.12	-	3.75
Norton	-	-	-	-	-	-	1.25	-	1.25
Osborne	-	-	-	-	4.37	6.25	6.25	2.63	15.60
Ottawa	-	-	-	-	-	25.13	14.12	5.88	45.14
Pawnee	3.63	25.25	1.75	15.37	21.25	7.00	4.87	4.25	83.37
Phillips	-	-	-	-	.50	4.00	6.50	-	11.00
Pratt	5.00	22.50	37.12	37.13	18.00	26.25	19.00	21.12	186.12
Reno	.50	5.50	43.75	148.50	124.13	33.50	36.00	42.38	434.26
Republic	-	-	-	-	-	1.00	11.25	9.50	21.75
Rice	-	-	.38	44.00	57.37	27.87	25.63	20.00	175.25
Rooks	-	-	-	-	1.62	5.00	3.50	2.75	10.87
Rush	-	1.25	-	1.63	8.62	1.62	1.38	3.75	18.25

Table 1. (concl.).

County	1935:	1936:	1937 :	1938 :	1939 :	1940 :	1941 :	1942 :	Total
	Miles								
Russell	-	.25	-	-	23.00	5.50	5.25	4.38	38.38
Saline	-	-	-	-	1.13	17.87	5.63	2.75	27.38
Sedgwick	-	-	-	8.13	32.87	47.50	34.00	32.37	154.37
Smith	-	-	-	-	-	3.25	2.38	-	5.63
Stafford	9.25	34.75	30.00	70.50	70.38	44.50	44.75	24.75	328.88
Sumner	-	-	-	8.88	21.25	10.75	36.37	42.62	119.87
Trego	-	-	-	-	-	2.00	-	.37	2.37
Washington	-	-	-	-	-	-	6.00	3.88	9.88

Source: "1942 Annual Planting Accomplishment Report", op. cit.,
Table 7 (Kansas).

CHAPTER IV. A STURDY SPECIMEN

Now that the Plains States Forestry Project, as such, is no more and it has been some 13 years since the first shelterbelts were planted, it is fitting to determine the stature of this emergency-born and emergency-sustained project. In order to do this, several pertinent questions will be considered. First, what change, if any, occurred in the attitude of the once skeptical public toward the shelterbelt program?

The conservative Kiplinger Agricultural Letter, in June, 1939, said of the Project:

Shelterbelt is making good. In 1935 it was pooch-pooed by many, including us, we are sorry to say. Yet now more than 100,000,000 trees, some 30 feet tall, are growing on over 20,000 farms from North Dakota to Texas. Eleven thousand miles of new tree strips, helping landscaping, crops and people.¹

Upon announcement that the trees on the A. H. Bungardt farm near Cordell, Oklahoma had reached fence post size, an associated press correspondent was sent out from Kansas City. He evidently contacted farmers who had once been doubtful of the project. As a result of the story he presented, editors from coast to coast gave many inches of space and big headlines to the work of the shelterbelt program. The change from skepticism to belief was clearly reflected in these headlines, some of which are given:

¹ A. L. Ford, "If Kiplinger Says It, It Must be Right!" Plains Forester, Vol. 4, No. 8 (July, 1939), p. 4.

Washington Star, U. S. Tree Planting Hailed by Farmers Once Skeptical.

Des Moines Register-Leader, How About Those Trees? What Once Skeptical Farmers Say Now.

Oklahoma City Times, That 'Crazy' Shelterbelt Cools Critics' Derision.

Denver Post, Shelterbelt Trees are Conquering Land Erosion.

Minneapolis Tribune, After Five Years - It Works! Federal Shelterbelt Reduces Erosion, Aid Crops from Dakotas to Oklahoma.

San Francisco Chronicle, Shelterbelt Trees Guard Prairies from Erosion - 'Crazy' Plan Succeeds in Halting Dust Bowl Destruction.²

When Mrs. Eleanor Roosevelt made a 70-mile tour of the shelterbelts in Reno County, Kansas on November 2, 1939, one farmer told her that the trees being planted through the Great Plains would be a monument to Franklin D. Roosevelt that would stand a hundred years. She replied that it had not always been that way; that, when the project was first started, many said it was a crazy idea. She said that at one time she had received hundreds of letters a day telling her how silly it was to attempt to plant trees on the plains. Another farmer declared that he could already see good benefits in crop saving and crop development. Mrs. Roosevelt asked the group gathered at one farm if many farmers were slow to accept the program. One gentleman responded with the statement that many people were very hard headed and because it was

² H. J. Swan, "Yes! The Shelterbelts Really Are News", Plains Forester, Vol. 4, No. 4 (May, 1939), p. 9.

a Democratic program a few of them would have nothing to do with it.

Realizing the benefits from the shelterbelts, some Middle Western Congressmen, by 1940, were urging the appropriation of \$2,000,000 to continue the work of tree planting as a WPA project. Clifford Hope, Congressman from Kansas, observed that the Shelterbelt Project had been, perhaps, the most successful of all the projects carried on during those years.³

The second question that arises is whether the shelterbelts served the purposes for which they were conceived. In the summer of 1944 a survey of the shelterbelts was made by E. N. Munns, Chief of the Division of Forest Influences, Forest Service, Washington, D. C. and J. H. Stoeckeler, silviculturist of the Lake States Forest Experiment Station, St. Paul, Minnesota. This survey was a random sampling of 1,079 belts in 93 counties of the six-state area. The sampled belts included more than three per cent of all the trees planted. The entire length of the zone was covered twice and data were taken on all of the belts along the route. The examined belts included those which had failed or had been destroyed because failures often provide valuable information for future use. The age, appearance, and other characteristics of each belt were noted. Attention was given to the kind and amount of cultivation and when this had been done. Each row of trees

³ Hutchinson Kansas News, May 16, 1940.

was examined as to survival, continuity of the row and height, diameter and crown spread of different species.

It was found that the belts were not planted in any set geometric pattern but rather to suit the farm owners and to give protection from the prevailing winds. Consequently, most of them were east-west belts and were planted on property lines. The belts varied in length from one-eighth to a full mile; 57 per cent being one-half mile in length and 22 per cent being one-fourth mile long. Some farms had more than one belt but most of them had only one. In some instances, larger farms were broken up into smaller blocks by interior belts.

The belts varied in width from one row of trees to 23 rows, although 56 per cent of them had 10 rows of from five to eight different species.

The age of the examined belts ranged from 2 to 10 years with an average of 6.5 years. In many of the belts which were from 5 to 10 years of age, true forest conditions had developed. In 19 per cent of the belts a leaf mulch had formed and the soil was in good condition. In the narrower belts forest conditions did not prevail because the leaves rarely ever fell within the planting and the sun reached the soil between the trees and dried it out.

In this survey, the belts were rated on the degree to which they had fulfilled the major objective of providing protection against the wind. The ratings were "excellent,

good, fair, poor, very poor, or destroyed".

In order to be rated as excellent a belt had to have continuity throughout its length, survival of 80 per cent or more, rather a uniform height and better than average growth.

A good belt was one with fair continuity, a survival rate of 60 to 80 per cent and satisfactory growth. It had already become an effective shelterbelt or gave promise of becoming such.

The belts which were rated as fair had some rather large gaps in the rows, an average survival of 40 to 60 per cent and growth rate below average. The failure of the trees was due to poor soil or to inadequate cultivation.

Poor belts had 20 to 40 per cent survival, many weeds and poor growth. These belts were chiefly those which had had little or no cultivation in their early years.

The very poor plantings were complete failures. They had a survival rate of less than 20 per cent and were full of weeds because of the lack of cultivation.

The destroyed belts were those which had been plowed out for various reasons, burned or grazed out, destroyed by cyclones or ruined in some other way.

In Kansas 74.3 per cent of the shelterbelts were rated as excellent, 15.7 per cent as good, 4.8 per cent as fair, 4.8 per cent as poor, 0 per cent as very poor and 0.4 per cent as destroyed. Throughout the entire shelterbelt zone 78.4 per cent of the plantings were rated as good or better, 11.2 per cent as fair and 10.4 per cent as unsatisfactory.

As pointed out in the previous chapter, the cultivation of the belt was extremely important. In this survey it was found that on the whole the farmers had done very well in cultivating their shelterbelts. During the war years, cultivation of many belts was not so good because of the shortage of manpower, machinery and gasoline. Probably in some cases, a lack of interest on the part of the farmer, or the lack of follow-up on the part of the foresters contributed to the lack of cultivation. In general, where one found a neat, well-kept farmstead the shelterbelts had received good care. Where the buildings were run down and weeds were everywhere, the shelterbelts usually had received insufficient care.

Cultivation was not the only care the belts needed. It was found in the survey that there was a tendency for some farmers to turn their cattle and horses into the belts. In Kansas the damage from this practice was found to be 7.2 per cent. In the other states it ranged from 2.4 per cent to 19.2 per cent. Some other problems found were (1) the replacement of trees which did not survive, or had been destroyed, (2) rodent control, (3) insect control, and (4) advisability of pruning.

Benefits from the project were "landscape improvement, control of wind erosion, snow traps along highways, protection of farmsteads, gardens, orchards, and feed lots, providing a haven for game and song birds, furnishing wild fruit for preserves, and providing fence posts and small poles for use on

the farm.⁴

An official of the British Colonial Forest Service, Dr. A. J. Gracovsky, spent several days, in 1937, at the Lake States Experiment Station and in South Dakota studying the work of the Shelterbelt Project. He stated that he thought the shelterbelt offered one of man's best answers to the problem of wind and water erosion. He was convinced of this by his observations in other parts of the world. He told reporters, "The Federal Shelterbelt Project in the middle west of America is the most promising of definite beneficial results of any in the world."⁵

Still another question to be answered in regard to this once derided project is whether it stimulated interest in the planting of trees.

A news article "Wider Interest in Trees" which appeared in a recent issue of the Kansas City Times stated that Kansas farmers were expected to order more trees this year to protect their homes and crops from wind damage because of the publicity given to the fact that the nursery at Hays, Kansas distributed one million trees last year. The trees were furnished at cost.⁶

The Plains States Forestry Project was directly responsible for the organization of some of the soil conservation

⁴ E. N. Munns and J. H. Stoeckeler, "How Are the Great Plains Shelterbelts?" Journal of Forestry, 44: 257-257, April, 1946.

⁵ "British Forester Praises Project," Plains Forester, Vol. 2, No. 4 (April, 1937), p. 1.

⁶ Kansas City Times, October 29, 1946.

districts because some farmers regarded the planting of shelterbelts as the best soil conservation measure in their farm program. The following is a summary of the trees planted in Kansas under the soil conservation program:⁷

<u>Year</u>	<u>Acres</u>	<u>Miles</u>
1944	381	27.3
1945	518	43.9
1946	557	51.4
1947	1148	134.12
1948	<u>1216</u>	<u>141.9</u>
	4202	427.52

The plantings are not so extensive under the soil conservation program as shelterbelt planting is only one phase of the soil and water conservation program. Furthermore, under this program the farmer must prepare the site, plant the trees and maintain them.

In Stafford County, Kansas which is organized as a soil conservation district 30,000 to 40,000 trees are planted a year.⁸ These trees are obtained free from the Soil Conservation Service nursery at Manhattan, Kansas. The farmers pay about one cent a tree for handling costs. These trees are planted mostly in field windbreaks of five to seven rows in width. Some farmers buy Clarke-McNary trees from the nursery at Hays, Kansas and others buy from commercial nurseries. These trees are used mostly in farmstead windbreaks.⁹

The final consideration in determining the effectiveness of the shelterbelts is the opinion of those who have belts on

⁷ Personal letter, Mr. Fred Sykes, State Conservationist, Salina, Kansas, November 12, 1948.

⁸ Fig. 1, Plate IV.

⁹ Personal interview, Mr. Glenn Spring, St. John, Kansas, August 25, 1948.

their farms.

Mr. W. C. Isern of Alden, Kansas felt that trees are worth while for their own sake. He was interested in the beautification of the landscape, the protection that trees would afford farm buildings and the general well-being of his community for the present and future generations. In short, he was interested in making his community an attractive place in which to live.¹⁰

William Thompson of Haviland, Kansas, who had one of the first belts in Kiowa County said:

The value of my tree belt can hardly be estimated. The trees add greatly to the appearance of my home; the protection they have given my livestock during the winter months has been worth an equal amount; they have been of great value in protecting my fields from wind erosion; and last but not least they afford protection for wildlife. We have many game birds now such as pheasants, quail, and doves, and of course many other birds that we never had before.¹¹

Russell County farmers who already had shelterbelts on their farms, made up 50 per cent of those who had new belts planted in the spring of 1940. The same was true for 31 per cent of the cooperators in Stafford County, 25 per cent in Pratt County and 24 per cent in Barton County. The average for the four counties which was 32 per cent indicated that nearly one-third of those who had belts wanted more.¹²

One farmer who has a farm on the outskirts of St. John,

¹⁰ E. N. Munns and J. H. Stoekeler, *op. cit.*, p. 253.

¹¹ *Idem.*

¹² G. W. Spring, "Satisfied Customers Are Our Best Advertisement", Plains Forester, Vol. 5, No. 4 (April, 1940), p. 11.

EXPLANATION OF PLATE IV

- Fig. 1. A 1946 planting in Stafford County, Kansas.
Planted under the Soil Conservation Service
program.
- Fig. 2. A 1936 shelterbelt on Mr. Blaine O'Connor's
farm near St. John, Kansas.

PLATE IV



Fig. 1.

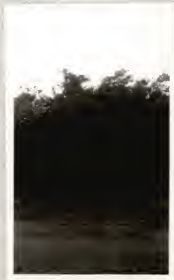


Fig. 2.

Kansas said that the shelterbelts had really put that country on the map as they made it look so much better. He remembered when there were not many trees. In his opinion, the trees were a definite benefit to the crops. He stated that he knew of one instance in which the only wheat one farmer raised was in the area where it was protected by a tract of timber which had been planted previous to the shelterbelt plantings. He felt that the money spent for shelterbelts was well spent. One farmer told him that the trees he planted would do him no good but he replied that he expected to live to shoot squirrels in his trees. He spoke of the pheasants and other birds in the belts.¹³ The belt on this farm was so placed that it not only protected the field to the north of it, but also gave protection to the farm buildings south of it. The trees were planted in 1936 and it was a beautiful belt, free from weeds and had ripe plums on the plum trees. The appearance of the trees gave evidence that this cooperator had been enthusiastic about the project.¹⁴

Mr. T. R. Withroder who lives north and east of Sylvia, Kansas in Reno County, was very much in favor of the project. He had seen the definite benefits of his belts which were planted in 1935 or 1936. In four years the cottonwoods attained a height of about 30 feet. He planted some trees later, himself. He thought that it might have been better if

¹³ Personal interview, Mr. Blaine O'Connor, St. John, Kansas, August 25, 1948.

¹⁴ Fig. 2, Plate IV.

EXPLANATION OF PLATE V

- Fig. 1. A section of a half-mile belt planted in 1938 on one of Mr. A. C. Bowker's farms south of St. John, Kansas.
- Fig. 2. A 1937 belt belonging to Mr. A. C. Bowker.

PLATE V



Fig. 1.



Fig. 2.

longer lived trees had been planted instead of some which do not live so long. He found it difficult to replace trees which did not survive for the older trees shaded out the young ones. Mr. Withroder declared that he would like to see more trees planted.¹⁵

A very enthusiastic booster for the project was Mr. A. C. Bowker, who has several farms in Stafford County. He had lived on his farm over 60 years and had seen many changes in the country. There were five shelterbelts planted on his farms during the project and he had planted one previously.¹⁶ Mr. Bowker referred to a terrible blizzard which occurred in that country in the 1890's in which many people lost their livestock. He said that, had the shelterbelts been there then, the storm would not have done so much damage. He went on to say that for a distance of 40 to 50 rods on the south side of his shelterbelt the snow lies on the ground instead of blowing into the roads and ditches. When asked how much he would take for his trees, he replied that they were not for sale.¹⁷ In a 1935 belt on one of Mr. Bowker's farms the cottonwoods were found to be about 60 feet in height. A forest floor was quite well developed, there being a mulch of leaves and branches to hold moisture and to decay. There were some trees missing but the belt, on the whole, was one of which

¹⁵ Personal interview, Mr. T. R. Withroder, Sylvia, Kansas, August 26, 1948.

¹⁶ Figs. 1 and 2, Plate V.

¹⁷ Personal interview, Mr. A. C. Bowker, St. John, Kansas, August 25, 1948.

the owner could well be proud.

This Plains States Forestry Project, born of an emergency, delivered to a bewildered public, doomed to an early death by some scientists, lived and grew on a lean diet of emergency appropriations - grew to maturity under the efficient care of the Forest Service. This sturdy specimen served the purposes for which it was conceived, caused the critics to change their attitude, and propagated itself in the continued interest in tree planting.

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