

KANSAS. FORESTRY.

■ THESIS.

BY GEO. H. KELLOGG.

1905.

KANSAS FORESTRY.

The world of today is constantly called upon to rectify the mistakes of the past. These mistakes often involve great problems but the progress of the ages is measured by the solutions. We cannot hope to solve all of the problems presented but must take them in the order of their importance. One of the foremost problems of today is how to secure a future timber supply. The treatment of timber for many years has been mainly in the wrong direction and this careless and unwise policy has gathered such great momentum as to nearly bankrupt our future timber business in these United States. The carelessness, ignorance and maliciousness of our white people has been equaled only by the savage. Immense fortunes have been destroyed each year by fire alone and the greater number were set intentionally, either from revenge or for sport. Many a fortune has been thus consumed because a few people wanted to make their berry patches or hunting ground more profitable. Lumbermen have sought immediate profits and have almost shut themselves from future business. They have battered the best forests with increasing efforts until the finer woods are fast becoming a thing of the past, and they walk about with an eager eye in search of the next best substitute.

Necessity is the mother of invention and the time is ripe for action. Fire, lumbering, turpentine-orcharding, tanneries, paper factories and grazing have brought us in sight of a lumber famine and the man of brains is now looking for a way out. Forests that were heretofore greatly unprofitable and inaccessible are now penetrated under great expense, the prices for lumber advance steadily but no increase in profits.

Granite steel and concrete ties have been tried as substitutes for wood. Rail Road companies, who are responsible for a great many forest fires, are now paying large sums of money for raising plantations of timber to aid in supplying their demand for ties, posts, telegraph poles and lumber.

Lumbering ranks fourth in the industries of the United States but it cannot stand there unless more conservative methods are employed and more people turn their attention to the culture of timber. The time when timber culture will be a profitable business has arrived. The timber question is one of the most vital questions in our national existence. Without timber, mining is impossible, farming is crippled, streams are uncertain and uncontrollable, beautiful homes are not found and the standard of civilization is consequently much lowered. The leading men of our country are today attacking this problem with brains and money. President Roosevelt gives it as one of the first problems to be solved, the lumbermen are cooperating with the government foresters, and capitalists are investing their money on a business basis.

Here is a field that is open to a greater or less extent to all localities and to both rich and poor. It is a work that each and all of the United States should labor to complete and it can only be perfected by the combined efforts of the government officials and individual lumbermen and land owners. And our present great state of Kansas should not and I dare say will not fall behind in this march of Progress. The state varies greatly in its adaptability to the growth of trees and especially so for a species that is given. The eastern half is generally quite well adapted to the growth of trees and supports a considerable variety of species while the western half is much less naturally adapted to this work

and shows a great decrease in the number of species grown thereon. The following list gives the distribution of the trees of this state. It is not to be understood that all of the species listed are especially adapted to the given locality, it simply gives the distribution of the timber and an idea as to where commercial forestry might be practiced and where only tree planting for added comfort, beauty and convenience would be advisable.

NOTES ON THE DISTRIBUTION OF FOREST SPECIES IN KANSAS.

Species.	Where found.
<i>Juniperus virginiana</i>	Scattering over the entire state.
<i>Juglans nigra</i>	General west to Ellis county.
<i>Hicoria pecan</i>	Southeast corner of state to Coffee co.
<i>Hicoria minima</i>	Eastern third of state west to Riley and Butler counties.
<i>Hicoria ovata</i>	Eastern tier of counties, west along ^{Kaw} river to Riley county.
<i>Hicoria laciniosa</i>	Southeast corner of state, west to Cowley and north to Wyandotte counties.
<i>Hicoria glabra</i>	Scattering in eastern tier of state.
<i>Salix nigra</i>	Eastern part of state. Along southern line to Barber county and Arkansas river to Gray county.
<i>Salix missouriensis</i>	Wyandotte, Pottawatomie and Riley counties.
<i>Salix amygdaloides</i>	Over entire state.
<i>Salix fluviatilis</i>	Over entire state.
<i>Populus deltoides</i>	Over entire state.

<i>Betula nigra</i>	Cherokee and Chautauqua counties.
<i>Ostrya virginica</i>	Eastern part of state. Along Kaw river to Manhattan.
<i>Quercus alba</i>	Atchison,, Leavenworth and Johnson counties.
<i>Quercus minor</i>	Eastern and southeastern counties.
<i>Quercus macrocarpa</i>	Eastern half of state. Common to Russel county, some in Rawlins county(Driftwood creek)
<i>Quercus acuminata</i>	Eastern third of state, west to Riley and Cowley counties.
<i>Quercus prinoides</i>	Northeastern and southeastern part of state , also in Riley county.
<i>Quercus rubra</i>	Eastern part of state west to Riley county
<i>Quercus velutina</i>	Extreme eastern and southern counties . Also in Riley and Pottawatomie, counties.
<i>Quercus marilandica</i>	Atchison, Doniphan, Pottawatomie, Riley and southeastern counties.
<i>Quercus imbricaria</i>	Atchison , Leavenworth and Wyandotte counties.
<i>Quercus texana</i>	Doniphan and eastern counties to Cowley county.
<i>Ulmus pubescens</i>	Over eastern half of state,, also abundant in Rawlins county.
<i>Ulmus americana</i>	Over state west to Thomas and Hodgeman counties.
<i>Celtis occidentalis</i>	Practically over entire state.
<i>Celtis mississippiensis</i>	Cherokee, Labette, Montgomery and Commanche counties.
<i>Morus rubra</i>	Eastern half of state, west to Smith, Osborne, Russel, Barber and Commanche counties.
<i>Asimina triloba</i>	
<i>Asimina Triloba</i>	Eastern fourth of state, west along Kaw river to Riley county.
<i>Sassafras sassafras</i>	Cherokee county.

<i>Platanus occidentalis</i>	Eastern third of state.
<i>Amelanchier canadensis</i>	Atchison, Doniphan and Brown counties in the north-east, Cherokee and Chataugua counties in the southeast.
<i>Crataegus coccinea</i>	Scattering in the eastern portion and west to Riley county.
<i>Crataegus mollis</i>	Eastern tier of counties, west to the Riley county along the Kaw river. Also along blue river.
<i>Crataegus tomentosa</i>	Johnson, Chataugua and southeastern counties.
<i>Crataegus crus-galli</i>	Eastern fourth of state.
<i>Crataegus viridis</i>	A few southeastern counties.
<i>Prunus americana</i>	Over entire state.
<i>Prunus hortulana</i>	Along Neosha, Osage and Kaw rivers in eastern part of state.
<i>Prunus virginiana</i>	Northern and central counties west to Russel county.
<i>Prunus demissa</i>	Republic and Lincoln counties west and south to state line.
<i>Prunus serotina</i>	Eastern fourth of state.
<i>Cercis canadensis</i>	Eastern third of state.
<i>Gleditsia triacanthos</i>	Eastern portion of state, west to Salina.
<i>Gymnocladus dioica</i>	Eastern half of state west to Russel county, also in Commanche county.
<i>Robinia pseudacacia</i>	Scattering in eastern third of state. (Probably INTRODUCED)

Ptelea <i>Ptelea trifoliata</i>	Eastern and southeastern counties.
Rhus decidua <i>Rhus copallina</i>	Extreme eastern counties.
<i>Llex decidua</i>	Cherokee and Labette counties.
<i>Evonymus atropurpureus</i>	Eastern half of the state west to Lincoln county.
<i>Acer saccharum</i>	Extreme eastern counties.
<i>Acer saccharinum</i>	Eastern fourth of state west to Riley and Washington counties.
<i>Acer negundo</i>	Common throughout the state.
<i>Aesculus glabra</i>	Douglas and Johnson counties.
<i>Sapindus marginatus</i>	Eastern half of state west to Barber and Hodgeman counties on the south.
<i>Tilia americana</i>	Northeastern counties west to Washington and Neosho.
<i>Cornus florida</i>	Cherokee county.
<i>Bumelia lanuginosa</i>	Southeastern counties west along the southern line of state to Barber.
<i>Diospyros virginiana</i>	Eastern and southeastern counties. Also in McPherson county.
<i>Fraxinus quadrangulata</i>	Southeastern counties.
<i>Fraxinus americana</i>	Scattering in eastern counties west to Butler.
<i>Fraxinus lanceolata</i>	Over entire state.
<i>Fraxinus pennsylvanica</i>	Practically the same as <i>Fraxinus lanceolata</i> .

<i>Viburnum lentago</i>	Eastern tier of counties.
<i>Viburnum prunifolium</i>	Southeastern counties north to Shawnee and west to Cowley.
<i>Pyrus ioensis</i>	Johnson county and along Kaw river to Manhattan?
<i>Prosopis juliflora</i>	Scattering specimens in Barber and Comanche counties.

It will be noticed that for the greater part of the timber has grown naturally in the eastern half and of course it would be easier to grow timber artificially where it grows naturally. In the eastern part of the state it is highly practicle to raise timber for commercial purposes. There is considerable land that is not well adapted to the growth of cereals because of its situation. It is quite well adapted to the growth of trees and there is sufficient moisture to afford good , rapid growth. The person who seeks a good locality and proceeds with judgement to produce a commercial forest will undoubtedly have gained for himself a small fortune within twenty years. At present Hardy Catalpa, an introduced species, is the leader for this purpose. It has been proved that it is well adapted and a highly profitable tree in the eastern and southeastern portion of the state. It is a rapid grower making ties , posts or poles in twenty years time. After the first four or five years it is all heartwood except four or five of the outside annual rings making it as durable when it is large enough to use as it is when well matured. It is not hard to propagate and is not badly infested with insect enemies. Is strong very durable in or above the ground and if properly cared

for will be straight. They make the best of ties, for they are more durable in the ground than oak and are lighter to handle. Although they wear more under friction, their durability in the ground more than balances the account. To verify the statements regarding the possibility of fortunes in commercial forestry a brief summary will be given for the four present, most prominent plantations. The data for this was taken by scientific government officials who had no reason for showing partiality. All of these plantations are situated mainly on the prairie land.

The Munger plantation in Green Wood county covers soil of varying degrees of fertility. Large numbers of Green Ash, Black Walnut, and Russian Mulberry were set for the protection of orchards etc, but in addition 135 acres of Hardy Catalpa were set for a commercial forest in 1887. They were set 4x4 and well cared for during the first three years and at the end of that time had formed a perfect canopy which has since been generally maintained. They did not make an entirely even and uniform growth because of unequal wind exposure and varying degrees of soil fertility. Where the soil is rich the trees are tall, straight and smooth, while on the poor soil they are more scattered and for this reason are dwarfed, have branched low and are crooked.

The forest's worst enemy (grass) is entering the poor unshaded spots and will eventually drive out the trees. The Catalpa has broad and tender leaves which are badly torn and blown from the trees if they are not protected from our worst summer winds.

Where the trees have been protected by a hedge of Osage Orange they show but very little damage from this source, while the trees that have been exposed to the long, unobstructed sweeps of south winds presented the following facts in 1900:- first row 9ft. high,

tenth row 14ft. high, and the twentieth row 21ft. high. A few rows of hardy, wind resistant trees would have made better growth themselves and saved the more valuable species. The ground cover is of course poor where the tree growth is poor, but where the tree growth is good the ground cover compares well with that of an ideal forest. Where there is not a good forest floor there cannot be a good tree growth. A good ground cover will furnish humus, reserve moisture, loosen the soil and allow an undergrowth of shade resisting vegetation which is essential in keeping out the grass and promoting the best development of the forest tree. We have the land and the fertile soil, if we can establish the natural forest conditions we are sure of success. And these conditions may be secured by planting the right kind of trees on the right kind of soil, and placing them close enough to shade the ground, keep out the wind that would blow away the leaves and moisture, starve out the grass and allow undergrowth. The average value of this forest not including the amount of firewood that might have been saved from trimming, was \$252.07 per acre when it was thirteen years old. In calculating the cost up to that age the following data was taken:

cost of trees-----	\$5.46
cost of planting-----	3.00
cost of cultivation -----	2.50
rent of land 13 years at \$2.00-----	\$26.00
cost of marketing products-----	<u>20.00</u>

Total cost per acre \$56.96

\$252.07 minus \$56.96 equals \$195.11 which divided by 13 or the number of years, gives a net annual income of \$14.01 per acre.

If we allow 6% compound interest on the investment, we still have

a profit of \$167.01 per acre above good interest on our capital.

Posts were being cut and sold when the forest was but nine years old and it has been estimated that in post form the wood was selling at \$20 per cord. The Farlington Forest, located in Crawford county, was planted by a Railroad Company. It contains 400 acres of Hardy Catalpa, 100 acres of Ailanthus and 40 acres of Osage Orange, White Ash, Black Walnut, Black Cherry and common Catalpa, but the Hardy Catalpa and the Osage Orange proved to be the only successful trees.

The establishing of the plantation was let by contract to Douglas and Sons for \$30 per acre. The trees were to stand 6ft. high, set 4x4 and a stand of 2000 per acre was guaranteed. The most of the trees passed from their care by the close of the second season and all by the close of the third. They were cultivated as a corn crop, three or four times each season. The cost of Plowing fireguards, and 62 1/2 cts. per acre for thinning, at the age of seven years was the only expense thereafter. Only the worst tree in every four was cut out, and this did not give the proper thinning, and consequently, according to careful determinations only 56% of the trees made a good, healthy growth. On the poor soil there was practically no ground cover, therefore no undergrowth and of course a scanty, low growth of timber. But as a whole this forest has a good undergrowth of which the most characteristic weed is White Snake-root. Other undergrowth in the form of trees and shrubs, such as red elm, white elm, red mulberry, wild raspberry, dog wood and poison ivy. Where the trees have been deprived of this undergrowth they present a hopeless case and permanent, valuable growth of the best trees is insured only by its presence. The average height of the 21 year old trees

was 34.5ft. The average value per acre as reckoned from the market prices for posts, poles and stakes, not including fire wood was \$390.21. The average cost per acre was calculated as follows:

cost of establishing as per contract-----	\$30.00
rent of land for 21 years at \$2000 per year---	42.00
cost of thinning-----	.62
cost of marketing products at lot. per post---	36.14
cost of supt. at 75 cts. for 21 years -----	15.30
Total cost per acre up to date	<u>\$124.51</u>

Subtracting \$124.51 from \$390.21 equals \$265.70 as net profit on the investment or an average annual profit of \$12.65 for the time the land was occupied. Allowing compound interest on the investment, we still have a clear profit of \$138.19 per acre.

Mr. Honnewell, president of the road when the Farlington Forest was set, soon after set out a 500 acre forest near the Company forest. It consisted of 400 acres of Hardy Catalpa and 100 acres of Ailanthus. He had a contract with the same men, but paid \$25. instead of \$30 per acre. Each 40 acres is surrounded by a bare strip 20ft. wide which is kept plowed for a fire guard; these strips make beautiful drive ways. Ten year after the last setting one thinning was made at the cost of 59 cts. per acre and the only other expense incurred since that time was the plowing of fireguards. The average height growth made in 18 years was 29 1/2 ft. The total cost is estimated at \$110.20 per acre and the average value \$376.30

This leaves a profit of \$266.10 for 18 years or an average annual profit of \$14.78 per acre. Deducting the compound interest on the investment leaves us a clear profit of \$176.87 per acre.

The Yaggy plantation in Reno county near Hutchinson covers over 400 acres. It is situated in a somewhat better district of land. The soil is looser and closer to water, there are, however, sand patches that are better adapted to the growth of Cottonwood or Willow than to Catalpa. The setting of this plantation was completed in 1892. The trees were grown in a home nursery at a much lower price than was demanded in the market. They were all cultivated the same as the other plantations except that it was not done by contract. They made a good growth and at the end of ten years were able to present the following results:

rent of land 12 years at \$2 per year-----	\$24.00
cost of growing seedlings-----	3.60
cost of planting trees-----	3.20
cost of cultivation-----	2.40
cost of cutting back and sprouting-----	2.50
cost of marketing-----	20.84
<hr/>	
Total cost per acre for 10 yrs.	\$56.54

This was on the best land which was set first, and the next poorer grades were each set a year later. The results on the different soils were as follows:

Kind of soil.	Age of trees.	Value.	Cost,
1st grade,	12 years.	\$315.21,	\$56.54
2nd grade,	11 years,	\$222.47,	\$ 47.64
3rd grade,	10 years,	\$115.85,	\$ 72.49

Average annual profit,

\$21.55

15.89

7.25

of \$14.87

\$ 44.69 which gives the total average per acer

As the above table indicates the best growth is obtained on the best soil: There were 100 acres of this plantation on very poor sandy soil and the trees were cut back to be started from the sprouts. On this land the trees did not pay for the cutting, while on the best land there was a net annual profit of \$21.55 per acre. If some tree well adapted to the soil, such as cottonwood, had been put on the sandy part, it would have made valuable growth. The Catalpa is as durable when grown rapidly as it is when grown more slowly and so there is no danger in placing it on the best soil. The Catalpa will not do well on clear sand or clay, but if the clay is several feet below the good soil, it will hold the water and be a great benefit.

The forest should be mixed more than it generally is. The trees that are adapted to the different grades of soil should be so distributed. For instance put the cottonwood or willow on the sand where it flourishes, the Catalpa on the best land, and the Osage Orange or Russian Mulberry on the less favorable upland. It is also often advisable to mix the trees on the same ground, that is, place the Catalpa and the Osage Orange together and the latter will furnish the shade, crowd off the branches of the former while young and cause it to grow taller and straighter, and the former will also cause the latter to grow taller in its struggle for light. In many cases such trees as Green Ash, Elm or Walnut could be used to advantage. Every plantation should be provided with windbreak and fireguards. The windbreaks should be composed of trees that grow taller, stronger and denser than those of the forest, but if no better trees can be had the Osage Orange will afford great protection. It is a great saving to raise the trees in a home nursery. The cost of bringing the Yaggy planta-

tion up to the conditions of the Douglas was \$11.70 while the Railroad company paid \$30. Mr. Yaggy also included a cost of \$2.50 per acre for cutting back and sprouting.

He used home grown trees which are cheaper and surer to grow than the ordinary nursery tree found in the market. Close planting is essential to a straight smooth growth, but they should be thinned after the lower limbs have dropped off. If the limbs are allowed to grow until they become large, they will not fall off when killed, but the tissue will grow out around the base and not be attached to it so that water and fungus diseases are directed to the heart wood where it causes soft rot which is extremely detrimental to Catalpa forests.

It lives on the heart wood, and many of the stronger, healthier looking trees will be broken over by the common pressure of a common wind. This damage may be avoided by crowding off the limbs when they are small.

On poor soil cutting back and starting from a leading sprout is often the best way to do. It gives a straight limbless shoot up to 8 or 10 feet and thus prevents the lower branches, and gives a more rapid and better growth. It accomplishes the same object as pruning and at a less cost. The cutting of a forest either for sprouting or for market should be in strips, otherwise the young growth will be destroyed by wind.

The above illustrations, have I hope, served to prove beyond a doubt that forestry is not only possible but also profitable in Kansas. Nearly all of our eastern part of the state is naturally adapted to the growth of timber. Barring the lumber question there has been heretofore a sufficient supply of timber for all of the ordinary demands of the inhabitants, but the most

of the timber grows along the streams and ditches that lead to them, so only a few people own the timber and they carelessly destroy it. They set fires to burn off their pastures or burn brush, and let it run through the timber where many times it all most destroys an entire piece of good timber. They give their best timber to people who will grub it out. When they cut it themselves they are wasteful, and never attempt to save any of the young trees. Some men will sell trees from \$1 to \$3 that will make 25 to 40 loads of firewood. There are, however, many homes in the eastern half of the state as well as the western that would be greatly beautified and increased in value by the addition of trees about the buildings and a wood-lot in the best and most convenient place. Many farmers have and every farmer should have and make it a part of his business to establish these comforts and necessities. The upland farmers, especially have neglected this and live content to take all of the hot and cold winds that sweep their homes summer and winter. This is because it is more difficult to produce trees on the upland, and some people think it to be impossible, but it has been proven to be possible in nearly all of our eastern localities if the right kind of species finds the right kind of soil and treatment. If the lowland timber is to be destroyed and the upland is not forced to produce it what will we do? Live without its use? No that will never be done. We will begin work when the last signal is given and ~~xx~~ we have forced ourselves to the task. But prosperous men, men who have made fortunes and enviable reputations have looked to a condition or opportunity and prepared to meet it before it arrived. And why should we now intrench for the coming struggle and thus save ourselves much loss.

The western half of the state , though as yet, not well adapted to the practice of commercial forestry, will support enough timber to make it a much more comfortable and convenient place to live and in many cases may be made an agent to serve the purpose of increasing profits. In the first place along ravines and water courses of all kinds there is a good chance to grow trees.

Such trees will greatly aid in checking erosion, will help to regulate the flow of the streams, beautify the landscape, furnish considerable convenient timber for incidental construction work and fuel, it is grown where nothing else would be grown and it at the same time raises the value of the surrounding land. It has been proved that for the best agricultural conditions from 10 to 20% of the land should be devoted to the growth of timber. Although this amount will probably never be reached in this part of the state the nearer we approach the amount , the closer we shall approach such conditions. That amount or more of the ordinary farm is useless for other purposes and the nearer we can come to covering such land with timber the richer we are. But the general rule with farmers is instead of planting timber, to not take the proper care of what nature has provided.

The western half of Kansas is classified as semiarid. Its average annual precipitation is about twenty inches, while in the middle and eastern parts it is respectively 26 and 34 inches. But nevertheless agricultural crops are quite generally successful in this locality and the reason for it , is that 87% of its moisture falls during the growing season. That is , western Kansas gets 20 inches during the year, and 15 In. during the growing season while in New York they get 35 inches during the year, and only 17 in? during the growing season. Now if such localities had to

contend with the unobstructed sweeps of hot summer winds that blow in western Kansas they would with their poorer land undoubtedly suffer as much from drouth as do the people of this western locality. Here there are few hills and very little timber, and the dry warmwind reaches great velocity, rapidly evaporating the already limited supply of moisture. The average annual evaporation in excess of precipitation is 34 in. And what causes this excess? It is the great velocity of and frequency of winds. Whatever we can do to check the wind we can do to save the moisture, we are doing just that much toward increasing the productiveness of the country for moisture is all that that soil needs. It has been carefully proven by experiment that a wind blowing at the rate of 25 miles an hour, will evaporate six times as much moisture as is ordinarily evaporated in calm weather. Now this is not an uncommon wind on the plains and we may plainly see that if we had some way of checking the velocity of the wind it would be far less liable to suffer from drouth. There is but one way to combat this wind problem, and that is to set and raise trees where ever possible. Experiment has proven that the evaporation is 66% more outside, than it is within the range of tree protection. And it has been said by careful observers that a rod of ground is protected by each foot in the height of a tree.

Then think of the moisture that would be saved by placing windbreaks about gardens and fields. Also by placing rows of trees at considerable distance apart, across a large field, so that the wind would be gradually broken as it passed, and if a whole neighborhood should do this what a difference there would be in the comfort, beauty and productiveness of the country.

Some localities in this section offer quite favorable inducements to the establishment of small plantations but the

majority of the people will not be able to accomplish more than to increase their comforts add to their convenience, and promote crop production by the establishment of shade trees, windbreaks and woodlots. It is possible to do a great deal more in the line of timber culture here than is ordinarily expected if the right man works with the right kind of species. There are of course some men who would never be a successful man and there are reasons when it would be useless to attempt such work, but a number of failures does not prove it to be impossible, rather a few successful attempts serve to show that it can be done. There have been quite a number of men who have attained success in this work.

Among the best trees for this part of the state are Green Ash, Osage Orange, Russian Mulberry, and Hardy Catalpa. The same as is the case in the eastern portion, Osage Orange and Hardy Catalpa are about the best trees to mix in planting. Either of these trees are easily regenerated by sprouts, especially the Osage Orange and thus a continuous supply of posts and fuel may be at hand. It is a great convenience and saving to be able to go out on your own farm and gather posts and fuel instead of going to a distant town and hauling high priced coal, and the man who can avoid a coal famine that his neighbors are suffering from will be able to realize two or three prices for any wood that he may have to sell. If trees were growing along all of the draws, ravines and streams there would be a more steady flow of water. The roots penetrating deeply into the soil would lead the water to lower levels instead of allowing it to run off on the surface and leaving the ground, and streams dry in a short time. Such trees would be growing on land that would not otherwise be used, they would check erosion, build up the soil, regulate the streams, furnish beauty and add value to the land, supply

the farmer with posts and fuel and after the first expense of starting would be a clear profit.

In raising trees on farmland they should be cultivated in a way to conserve the greatest amount of moisture and crops should never be grown between rows. Of course this work will not be accomplished in a short time ,nor will thenpeople all start together, but some will have to take the lead and these will be well paid for their time and money spent. A number of successful attempts have been made and they are still being made and if each one would try , it would bring advantages to the people of western Kansas.

The time is coming , and has come to many people, when they will see fortunes in the woods. The man who has had good sense enough to take care of and save a piece of timber will be able to exact two prices for the products Before another generation. In New York, where people used to sit up nights to burn the logs they had piled together during the day , they are now paying more for wood than is asked for coal, and innsome cases they cannot supply the demand. The timber question is a national problem and we as a part of a nation should compete in the solution. The Federal Government has established a forestry department at great expenze, but it ~~cannot~~ accomplish only as much as thenpeople are willing to help them accomplish. If we show a willingness to sooperate with the government foresters we shall receive aid from them in the same proportion , but if we work against them , as has been the case in some places, we need not expect any very good results. A great deal of the eastern portion of thenstate is able to support commercial forestry while there is scarcely any part of the state that would not give growth to a few hardy species of trees. Then let every farmer take it upon himself as a personal duty to establish as many trees as the

natural conditions of his surroundings will permit.