

For once I believe we are on schedule, almost half an hour to the good. It is now eleven o'clock, and you can retire to the exhibit room, which is in the wing to the left on the same floor, or disport yourselves as you see fit. Thank you.

Tuesday Afternoon Session

MR. STOKES: The first item we have this afternoon is, "Oaks, the Mountain Corn Crop", John W. Hershey, Downingtown, Pennsylvania. Mr. Hershey is not here, and his friend, Dr. J. Russell Smith will read his paper.

DR. J. RUSSELL SMITH: When the call came for papers for this meeting, I recalled that Mr. John W. Hershey had been experimenting with oaks and asked him to write a paper telling of his experience with them, after which I would like to discuss the significance of the oak in the future of America. [See also p. 176.—Ed.]

NN 6A Annual Report 40:39-42 (1949)
Acorns—the Mountain Corn Crop

MR. JOHN W. HERSHEY, Downingtown, Pennsylvania
(Read by Dr. J. Russell Smith)

Dr. J. Russell Smith has asked me to write what I know about the oaks. Then he will give a paper on how much America is missing by not oaking our forest ranges and rough land.

In 1934 Dr. Smith inveigled me into starting a tree crop project for the Tennessee Valley Authority. We hired Dr. Ernst J. Schreiner for breeding forest crop trees. This was the first forest breeding work on such a large scale known to the world. Thousands of pollinations were made, many hundreds in the oak species.

Schreiner has one of the most brilliant genetic minds extant, so naturally the work was started along fundamental lines of selecting parents of upright timber type stature, resistant to disease and insects, good bearers producing sweet acorns, and freedom of worms in the acorns.

Natural Variations in White Oak Group

In three years I photographed seedlings of these crosses in the same species but of different parent lines; some 6 inches high, some 36 inches. This shows the possibilities of genetic work for reforesting vast areas of the United States.

We ran a contest in the TVA for sweet acorns. We procured amazing answers in white oak, swamp chestnut or basket oak, and chinkapin oak. When I came home I procured wood from each of these prize winning trees and grafted them at Downingtown. In four years the white oaks bore; one had thirty nuts.

My interest in this work led me to a careful study of Dr. Wildman's book, "Penn's Woods," which is a catalogue of old trees within the environs of Philadelphia: stately monarchs standing when Penn was here, and not on relief yet—marvelous genetic foundation stock.

In 1938 my good wife and I made a survey of these William Penn white oaks and one bur oak. We followed the pattern as laid down in the TVA.

The variation was amazing in many respects. The most fundamental were: some loaded with wormy acorns; others nearly free of worms.

The oak, like so many other things in nature, is jumped through hurdles we decide for them and, failing to make the grade, is assigned a low I.Q. Years ago the brush nurserymen labeled it hard to transplant and a slow grower, so one of America's best groups of trees has been left out in the cold because we didn't know how to cotton up to it. The following explodes this fallacy.

Their variation in the seed bed is another fundamental in behavior. In two years, the seed from one tree made growth of four to six feet while that from another grew from twelve to sixteen inches. Of these best seedlings we transplanted a number at one year of age. The chinkapin and bur oaks were ten to twelve feet high in six years. The white species, put on poorly prepared sod just turned down, made six feet in six years.

We thought that pretty good, but since setting out a bunch of two year white oak seedlings in 1945 at our new nursery we have many eight to ten feet in 1949, five years of growing time.

Here, on America's No. 1 Tree Crop Farm, we planted in spring of 1945, about fifty oaks in grove formation. In one location, on a rocky knoll of thin, lifeless soil we planted seedlings of bur and chinkapin oaks, six-to-ten-foot sizes. Care has been one shovelful of composted back house manure when planted; the next year a heavy mulching of pea vines and one application of manure applied on the field with a spreader. For three years we pulled the weeds or mowed. For the last three years we have had little manure-making machines pasturing under them. These trees have made a tremendous growth. The chinkapin oaks, a little heavier when planted, are fourteen to sixteen feet high; the bur oaks are ten to twelve feet. The chinkapins are sprinkled with acorns this year.

On another planting of 21 oaks, mostly grafted, there are several trees each of one variety of bur, a white x bur hybrid, white oak, basket oak, and chinkapin oak. One white oak four feet high is bearing six acorns this year. The three white x bur hybrids, four to six feet high, are all bearing. One six foot tree of this cross has fifty-nine nuts on it. None of the seedlings have borne to date except a few of the chinkapins.

As to understock, we have white on white, bur on bur, chinkapin on white, and white x bur cross on white. I have found no incompatibility between hosts and guests. In grafting we use the modified cleft graft.

Here are a few facts of great importance that I have observed or been told by reliable persons.

Crop Production

The most thrilling production is the one I saw myself. Touring the countryside in the fall of 1939, hunting acorns for our list of pedigreed trees and about to give up, in disgust, I noted we were close to Oxford, Pa., so I called on the monarch of the village green in that town. The sight was so startling that you could hardly believe it while looking at that giant of 61 $\frac{3}{4}$ inches, breast high, and 150 foot crown spread. The ground was completely covered with acorns, while every twig and branch drooped

with acorns. One wondered where the nuts on the ground came from, for the tree still seemed overloaded.

We gazed, we gasped, we held our breath; we were amazed. Our backs were tired from hand picking a few under this tree. What to do? I couldn't see picking all those nuts by hand. I thought it over, then bought a bamboo lawn rake and with a swipe each way for fifteen to twenty feet had a nice windrow of acorns. Betty held the bag, I scooped, and in twenty minutes we had five bushels of nuts. Surely thirty bushels of acorns fell from this tree and fifty bushels would be nearer it. Assuredly, a hillside of these strong, disease-free* trees, with sweet acorns nearly free from worms and with only slight astringency, would make a nice farm crop for 350 years. They run 174 per quart. A little figuring shows that six of these trees per acre would make 274 bushels of corn feed per acre—not bad!!

Acorn Bread—It's Good!

A story of discovery in California or China cannot impress us like one close to home. Here's what an interested customer living in Delaware did: "I gathered acorns from a red oak tree in the spring. Due to winter weathering, most of the high content of tannin in the acorns was leached out. Nuts were ground with a fine food chopper, then water was poured through them on a seive until, in a few minutes, it came through clear. I placed them in a double boiler and boiled until 'mushed'. The mass was dark, with a strong medicinal odor."

"After drying and grinding to flour three tests were run, with respectively, one third corn meal, one third wheat flour, and one third oatmeal. Mrs. Roberts, the cook, intended using yeast, but feared the acorn meal too coarse, so used baking powder. She observed the flour was very oily, so used no shortening.

"All baked well. The oatmeal mixture was adjudged the best blend and considered as being of wonderful flavor, as proven by parents and children eating one hundred cookies in short order." She brought me a sample. My reaction was that the cookies had the high flavor of a nutty brown oatmeal muffin: very good.

As Poultry Feed

James Sonner, Hillsboro, Ohio, TVA prize winner for chinkapin oak, *Quercus muhlenbergi*, says he can hardly get seed, for chickens keep them cleaned up. This particular acorn is as tasty as a Japanese chestnut, and decidedly sweeter.

As Hog Feed

This interesting incident was recited to us by Mr. Horton, then assistant county agricultural agent for Coffee County, Tenn., in 1938.

This not only gives concrete data on the value of tree crops in a land economy, but shows the value of tree crops to the individual farmer. Said he, "We have a farmer here who turned twenty shotes of the Poland China breed, weighing about thirty pounds each, into a two-acre wood lot pasture of white oak acorns. With no other feed but acorns and what they could pick up in the wood lot they gained thirty pounds each in 42 days, that being 600 pounds of pork from the two acres. The acorn supply

*See item on page 50.—Ed.

then being exhausted, he turned them into alfalfa, feeding them two bushels (112 pounds) of corn per day. At the end of fifty days he sold the lot, and their weight was at that time 192 pounds each, making a gain of 30 pounds on acorns in 42 days and 132 pounds on alfalfa and corn in 50 days." The latter gain of 2¾ pounds per day per hog was a figure we could hardly swallow, regardless of the fact that the agent declared the hogs were weighed every two weeks and records were carefully kept.

But Willis Shadow, then county agent of Meigs county, cleared us up on this point. Mr. Shadow is an authority on most of the farm sciences, and very reliable. He described it thus: "The hogs were young and thrifty, and because of having been fed upon acorns which were deficient in protein, their gain was of carbohydrate and oils. Being pumped full of these foods, when they hit the alfalfa, a heavy protein carrier, with some corn, a carbohydrate, they absorbed protein rapidly to balance the excess of carbohydrates stored in their systems. Therefore the acorns not only made the farmer a profit by the putting on of weight without cost in the first 42 days, but created a condition in the hog's system whereby it could and did utilize protein very rapidly when put on the alfalfa."

For Hogs With Timber Production

Dr. M. L. Barnes, president of the bank of Beaver Dam, Kentucky, told me in 1943, "Our bank made a survey a few years ago which showed that Ohio County, Kentucky, grew and produced more hogs before 1890 on mast than since, with the timber now cut, and the hogs fed on corn."

Acorn-Fed Children

Fred Ashworth of Haselton, New York, twenty miles south of the St. Lawrence river, who supplied me with scions of the white x bur oak hybrid, wrote me in 1948: "I'm mailing you a quart of seed—can hardly get any because the children pick them up to eat them as rapidly as they fall."

A Catalogue of Hog Feed Species

The following is the family of mast oaks that should be planted on a national basis, except any other whites natural in local areas:

- (a) Chinkapin oak, yellow oak, *Quercus muhlenbergi*, one of the finest, usually sweetest acorns. Wonderful for game and poultry because of its small acorn size. Leans to ridges and dry, poor sites, particularly about limestone ledges, but a strong grower on deep, fertile soils.
- (b) Chestnut oak, *Q. montana*, (tan bark oak). This, like the chinkapin oak, is a ridge tree, tolerating dry, sandy land. The farther south it goes the less widely it is distributed, sticking to high plateaus and hill ranges. In this you have a double-header in that you can sell both bark and hog meat from it.
- (c) Swamp chestnut oak, *Q. prinus*, (formerly *Q. michauxii*), known also as basket oak because of its nice grain in working into baskets. Natural to low land southward and, like "swamp white", (*Q. bicolor*) farther north, can stand semi-wet feet. Nuts a great large piece of

juicy "hog biscuit". The TVA first prize winner (in northeast Mississippi) ran 36 acorns to the pound.

Masting a Natural Bitter Acorn Range

Tannin is a serious feature if acorns of the red oak group are not properly handled. The stomach of the hog will shrivel up, causing death on a full diet of bitter acorns. The thing to do is to plant a bunch of other fall fruits, haws, persimmons, and honeylocust, to feed the animals until the bitter acorn has leached a while.

Grafting on Order

Now, if you wish to start with a tree, we have a few two-year grafted Lint white oaks. We will graft any amount on order. That's the TVA winner in white oaks. All of the William Penn white oak seedlings, of which we have a few hundred, have possibilities, for their parent acorns are remarkably sweet.

Tree Crops for Feed, Food, Soil Conservation, and the Northern Nut Growers Association

J. RUSSELL SMITH, Swarthmore, Pennsylvania

I trust that the significance of Mr. Hershey's work is appreciated by at least a fraction of this audience. He has done work of great originality as things go in America. It cannot, however, be claimed that he is working in a new field, or dealing with a new idea. The acorn is one of the age-old foods of primitive man. It has been used for unknown hundreds of generations, probably thousands of generations, in a belt running across Asia and Europe from Korea to France and England and across America from Maine to California.

In the ninth century, a French bishop in a period of food shortage, such as came often in those days, sent a letter around his bishopric, urging his clergy to see that their people were saving acorns to tide them through the winter.

The frontiersmen's hog has fattened on acorns in the settlements in the Atlantic colonies and later the states, for more than 300 years. And this year, as in every year since the arrival of Europeans in America, pigs will fatten themselves on acorns on hundreds and even thousands of American farms. Before we came, acorns had fattened bear, deer, turkey, and many other animals that gave meat to the Indian.

The Missouri Botanical Garden has made excellent bread out of acorn meal and published the results. Ten years ago in Arizona I was assured that each year Mexicans came across the boundary with trucks and hauled away truckloads of acorns for their own food. Unfortunately, the idea of taking acorns seriously seems to bounce off the American cranium as peas bounce from a turtle's shell. The *National Geographic Magazine* in 1918 had a

present this to their readers. As the lots of nuts were received a card of acknowledgement was mailed.

MEMBER:

You evidently feel that your contest confined to a geographical area such as a state will produce results superior to those from a contest such as those sponsored by the Northern Nut Growers' Association over all the states?

MR. WALKER:

Yes, I do. The intensity of coverage of a state contest far exceeds

any response that may be obtained by an association contest. I have not as yet heard the report of the 1934 contest of the association, which covered many states, but probably the 917 entries of the state in the Ohio contest will exceed for hickories alone the total that was obtained in the national contest. A state contest raises a challenge. We progress by competition and I challenge all states to put on contests with cash prizes totaling only eighteen dollars and obtain 423 sample lots of black walnuts in one year and 915 entries of hickories in another year.

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Why People Don't Plant More Nut Trees

By JOHN W. HERSHEY, *Pennsylvania*

THIS subject, which is of vital interest to all nut tree nurserymen, has caused a lot of serious thought. When Ford Wilkinson wrote asking me to cover this subject, the amusing thought struck me, "If Ford thinks he is going to get a 'cure-all' expression from me, he might be disappointed the 'darndest.'" Why he stuck this thought on me for exposition, I don't know, because he has had more experience in this field than I have. However, because the job has been handed me, I am going to give you what I believe to be the situation.

I find two important angles in this field which must be given serious consideration. First, what I am pleased to call "bread and butter economics" and second, "philosophical economics."

Under the first caption we have the undeniable facts that nut trees cost more money than fruit trees and that the situation exists that the average small buyer, who to a great ex-

tent keeps the average nurseryman alive, thinks in terms of a tree "that bears something" worth just so much. Now, what I mean by that is that he thinks of cost in terms of a peach or apple tree or, in short, any of the common fruit trees.

There is no use in going into the philosophical discussion regarding how much more valuable a nut tree is. The fact exists that he isn't buying because that's the way he thinks, and when he can buy all the apples and peaches he wants from 20c up to 50c or 60c, he isn't paying \$1.50 to \$3.50 for a nut tree. True, we realize the argument is without foundation when the result from the tree is concerned, but that doesn't pay the nurseryman's bills.

Then, again, there is the angle of "conscience control" among most nut tree nurserymen, or at least among those in our "click" (the Northern Nut Growers Association nurserymen), which has prevented a rapid,

unscrupulous, tree crop development.

Now, if you want the nut tree nursery business to expand and grow rapidly, I suggest that some high-pressure promoters be interested in taking hold of the business and putting it over in the way that so many of the common run of nurseries are operating. For instance, I recall one year (when sales were dragging their feet rather heavily) a nearby nursery sold 5,000 seedling English walnuts for \$4.50 each, for which they paid 50c apiece. Such conditions nearly make a person pull his hair out.

This was done by a high-pressure program of having a sales force go out to sell the public anything. An excellent bait in this program is to give the salesman commission enough to salve his conscience for telling the people what he does.

Along with this program of "putting it over" on the public, there must be the feature of doing as some fruit men do, buying (for a fabulous sum) a carload of a new fruit that is just coming into bearing, from the first orchardman who has them for sale, and then nationally advertising that this variety is bringing so many thousands per carload. On top of this criticism of such nursery practices, I want to state emphatically that the public wants to be "bamboozled" and that if an honest politician seriously wants to do his country a benefit by getting into office, he has to act the mountebank to get there. The same thing holds good in salesmanship; you must "bamboozle" the public if you want them to "bite" in a big way, even on an honest thing.

I feel that the above illustration (of the public buying common seedlings against good grafted English walnuts), with a lot of my other experiences, is evidence that the above statement is true. The honest nurseryman has this consolation, he is not "out of pocket" so much by not

selling his stock as the person who paid \$4.50 for a 50c seedling.

Then there is the question of whether we are fully doing our duty as watchmen on the walls of Zion in properly nursing customers along in the form of teaching them successful methods in cultural care of their trees after they have bought. I recognized this condition shortly after I started in the nut tree business, and feel that the major part of my success and (if it isn't too egotistical to say so) that a great part of the advance in the nut tree world has been due to my campaign of studying why nut trees don't grow after they are planted, and then running an intensive campaign of teaching the customers how to take care of the trees. This feature did not seem to be recognized by the pioneer nurseryman. As we all know, it takes several generations to evolve a real philosophy and those men can not be criticized for not having covered this meritorious point. In fact, I feel they can be given credit for doing two or three generations of work in the short life of the tree crop thought. But I saw this condition soon after entering the work, and prosecuted it, with the result that there are many interesting nut groves on the threshold of coming into bearing.

The thought of why people have not planted more nut trees has been, as stated before, of considerable concern to the nurseryman. But I feel confident that the northern nut growing industry as a whole is on a much firmer and healthier plane, with seemingly slower growth, than if it had been put over on a promotional scale.

When I check over the chaotic conditions which existed in the childhood of the fruit industry, the southern pecan industry and the west coast English walnut industry, I am delighted with the fact that such heart-breaking, money-losing, suicidal experiences have not been introduced

into the northern nut industry. Although the growth seems slow when compared to the usual inflated, unhealthy spirit of American development, in checking it with philosophical progress I am inclined to believe the industry is moving along at a very rapid pace.

Relative to the second angle, "philosophical economics" (which is greatly influenced by the above mentioned "bread and butter economics") under the erroneous educational system which has almost put America into bankruptcy, the old, old tree crop or nut growing thought (new to this generation) has suffered together with our whole cultural system.

We can not expect thirty million farmers in the United States to think in terms of "tree crops" (something which takes time and patience) when our educational system teaches that the only enjoyment in this life is the enjoyment that tantalizes the sensations, in the same manner as the stroking of a cat's back brings its sensation to a place where it starts to purr. With this "complex" being built up in the minds of all the people, their thoughts naturally reverted to that of getting money to buy the things that would give them a pleasing sensation.

With our vicious educational system mutilating and debauching the minds of youth along these lines, the youth mind has naturally turned to methods whereby money could be gotten quickly. Hence, the present day racketeer methods instead of "tree crops."

One of the most appalling features that I find in my contact with the human race today is that too many of the conventional, business, philosophical, religious and political minds are nothing more than racketeers who are figuring constantly on, "How can I get my share away from the rest of the herd, so that I can enjoy

my sensual pleasures to the fullest extent of disaster?" This may sound rather like an abstract philosophy to you, but I wish to emphasize that it has had a distinct influence in relationship to conservation, or rather lack of conservation, of our natural resources, whether it be tree crops, forests, soil or mineral resources.

Then another phase of thought that has been playing "Hob" with our composure of mind (I'm speaking of the national mind) is that in the mad scramble to get money we have looked at the agricultural soil as a factory or machine which can be forced to produce what WE need to gain our goal. To illustrate this point: Some time ago one of the popular national figures presented the following thought in the daily papers. He drew a picture of the old Pennsylvania Dutch, or any conservative class of agriculturists, living a practically self-sustaining life on a given piece of soil. He said this was good enough for agriculture in the past but the farmers of Kansas and the Middle West can never expect to obtain economic security in the future until they recognize business features that have kept the large corporations going. He then enlarged on the future of successful agriculture, in which the people will live in villages and the workmen will be systematically distributed among the farms in plush-seated busses each morning, and will be picked up again in the evening. He stated further that the good, old method that existed of each farmer living on his farm and by integrity and frugality maintaining an almost self-sustaining empire, is past and the new method above mentioned (a method that will use the bus and city life as an insulator between man and the soil) is the thing that will save America's future farmers. He said this in face of the condition that exists in the

West and in too many rural sections today.

A picture of this condition is exemplified by the following expression of a neighbor of mine in Tennessee who told me about his brother in Kansas. "No, sir," said he, "that life wouldn't suit me. You work like a fool all week, then rush into town for a roarin' time over the weekend, and back again for another week's work, no home life, no interest in your home, no trees or plants to make your home life beautiful, no, sir, that don't suit me."

Now, I ask this audience: How can a people have the desire to buy nut trees when they have no more love for the soil than to wring it dry of all its virtues and then allow it to blow away? And how can we expect national thinking to get on a firmer basis when such opinions as mentioned above are broadcast by national leaders, when this method (partially in use as above mentioned) has proven the downfall of the semi-arid countries and the financial downfall of many high-pressure farmers in all sections of the country. I wish to call to your attention that when he uses the corporation as a standard of measurement he is again deceiving the public, because the large corporations have only weathered the depression by unethical business practices and inflation methods.

And again I ask: How can we think along the lines of fundamental truths when, after our erroneous debauch of the past several decades, one of the leading minds in America made the following press remark: "David said, 'I have never seen the righteous forsaken nor his seed begging for bread', but if David lived today I would show him a lot of righteous and their seed begging bread." After we, the American people, have dissipated our natural resources in wanton living, and we insist that it is God who is wrong, my

expression is, "Hence the answer to why nut tree planting has been so slow."

You will notice I made the previous remark that I am delighted with the advances that have already been made or the marked progress that exists in nut cultural development. One of the reasons why I am so delighted in this progress is because it has been made against the odds of our modern, kaiser-cultural thought of materialism, because our leaders have philosophically handed us a stone instead of bread, which resulted in the adverse conditions starting in 1929. But I am pleased to report a happier tone or trend, in that, despite these conditions, there are a goodly number of people who are thinking in the terms of what value their lives will be to posterity and of what relationship the influence of their lives will be to the happiness of the third and fourth generation.

The so-called depression has truly brought the American people out of their wild and glamorous orgies to clearer political realization of the necessity of the conservation of natural resources. I want to say again, that although from the hurried Americans' yardstick of measurement the tree crop nurserymen may not get immediate results from this depression, I do know that they will all be better off for it.

In closing, I would like to go on record (this thought may be a little bit too much in advance of the common trend) as suggesting that this Association's name be changed from "The Northern Nut Growers Association" to "The American Tree Crop Association" or "The Northern Tree Crop Association," as you will find, as time goes on, a greater and wider interest will be taken by this body in all tree crops. I want to illustrate this by showing that you are subconsciously reaching out for other things in this connection, in the form

of interest in persimmons; some of the weak-minded members are leaning towards honey locusts, others towards papaws and still others towards mulberries, so I would like to sug-

gest that we individually come out from doing these things in obscurity and, in a concrete body, make "Tree Crops" a plank of this association's platform.

The Value of the Pecan Industry in Southern Illinois

By H. C. NEVILLE

Farm Advisor of Gallatin County

I AM acquainted particularly with Gallatin County which is just across the river from Indiana and Kentucky. It is located in the southeastern part of Illinois, bounded by the Ohio, Wabash and the Little Wabash rivers. In this territory we have some two thousand or two thousand five hundred acres of native pecans. The land is subject to overflow when between twenty-five and forty feet of water stands around Shawnee Town and water covers about 45 per cent of the territory, which is very rich and fertile. In this area we have two central buying places with a group of merchants in Shawnee Town and another in New Haven. Of course they buy pecans as cheap as they can. During the last three or four years we have been trying to teach people something about selling pecans. We became interested in this in 1931. Mr. Wilkinson joined us, so did Mr. Marsh from the University of Illinois, and so did Mr. Sawyer. We made a brief survey of the entire

area and as a result we took it upon ourselves to put on a native pecan show. The purpose of this show was to find in that group of trees larger and better pecans than we had in other areas. I don't know, previous to that time, of one man in the entire county having any grafted varieties on his place. In 1932 we had twenty-five entries of native pecans. In 1933 we had another show and Prof. Sawyer and Mr. Wilkinson were present. They thought that twenty-five of the entries were better than the one that won first prize the first year. In 1934 we went to New Haven instead of Ridgeway. We had forty-eight entries there, any one of which I would say was better than the one that won first prize in the first contest. I would say that they were 95 per cent better than the regular orchard run that came out of that native grove. Now what has happened as far as price is concerned? The price of the orchard run in 1930 ran about 8 or 9 cents.